

COMPUTERWORLD

Users to Tandem: Slow down!

By Michael Goldberg
SANTA CLARA, CALIF.

Tandem Computers, Inc.'s rapid-fire updates to its proprietary NonStop Kernel operating system have left users scrambling to keep up and frustrated by the resulting systems problems, Tandem's user group president said last week.

Top complaints include a lack of vendor support and the difficulties that application developers face trying to keep pace with the frequent operating system

revisions, charged David Lawler, president of the International Tandem Users Group, which met here last week.

"We're struggling to keep up with hardware and software rollouts [every 12 to 15 months]. It's painful to cope with the resulting software changes," Lawler said in a speech to more than 1,000 users and attendees at the ITUG Summit '95. "It puts a big workload on the user base just to stay even."

In an unrelated move, Tandem President James Treybig

announced he will step aside once a replacement for him is found (see story, page 16).

Something to talk about Lawler's remarks, based on anecdotes shared with him by fellow users, stirred talk at the conference — but not just among users. Tandem officials privately fumed about what they called an unexpected attack. Some users and software developers said Lawler was really complaining about the rapid pace of change in computer systems in general and that it was wrong to single out Tandem.

In response to Lawler's speech, Dave Wilson, Tandem's product marketing manager for parallel software, said the vendor will change the way it releases operating system revisions. Instead of bundling together bug fixes and new functions, the company will provide a menu of software products for users to select whether they want defect repairs, new features or both.

Tandem's general practice of releasing updates to its operating system, **page 16**

Sun regains pace with 64-bit chip

UltraSPARC line quadruples performance

By Jean S. Bozman

It's been a long time coming.

But Sun Microsystems, Inc. on Nov. 7 will unleash the first in a series of workstations and servers that kick off the revamp of its entire line over the next year to 18 months. The new machines will be based on 64-bit UltraSPARC chips, powerful RISC processors that should propel Sun once again to a leadership spot among high-performance workstation vendors.

"Sun wants to reclaim that high-technology throne that they had," said Dennis Courtney, chief information officer at Dunlop Tire Corp. in Amherst, N.Y., which uses Sun workstations and servers.

"They had an initiative toward commercial robustness [with their servers], and now we see the move back into the screaming technology and performance," Courtney said. "Having both is a good combination."

The new systems — code-named Fusion and priced in the \$20,000 to \$40,000 range — will offer roughly four times the performance of older midrange systems. They will handle multimedia and high-speed networks much more easily than today's machines, users and analysts familiar with the systems said.

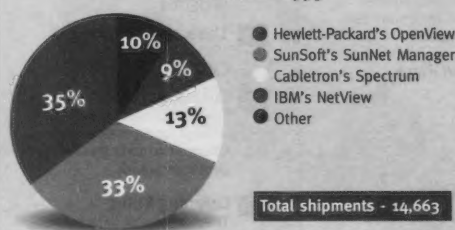
"Sun has to hope that the price/performance of the UltraSPARC is so good that people will switch," **page 121**



Dunlop Tire's Dennis Courtney: UltraSPARC will bring 'screaming technology and performance' to Sun users

Net managers clamor for business reality check

Network management platform shipments during the first half of 1995



Source: International Data Corp., Framingham, Mass.

By Patrick Dryden
DALLAS

The time has come to put technology for managing networks and distributed systems to work supporting business needs, said many of the participants in the Enterprise Management Summit '95 conference here last week.

Attendees clamored for more than the ability to discover and monitor devices or applications

on their networks.

As they become more dependent on client/server as well as mainframe IBM SNA configurations, they want help beyond reactive fault management. They need tools that work together so they can predict the impact of growth and measure performance.

And they need all of this within limited budgets and staff expertise.

Reality check, page 121

Data warehouse rests on Web frame

By Kim S. Nash

Cracker Barrel Old Country Store, Inc. is combining its first major internal Internet application with an initial stab at data warehousing.

The \$641 million company in Lebanon, Tenn., has crossed into uncharted territory with what analysts call an innovative and ambitious project.

Cracker Barrel hopes to steer clear of the costs typically tied to building data warehouses, which are databases designed specifically for end-user business analysis.

"A big problem in data warehousing in general is hooking up users who have all different systems on their desks," said John Robb, an analyst at Forrester Research, Inc. in Cambridge, Mass. "But on the Web, that's not an issue."

Many users dabbling with internal company webs have so far stuck to relatively simple applications, such as human resources or telephone directories. But not Cracker Barrel, which owns a string of home-style restaurants throughout the Southeast.

Warehousing, page 16



Cracker Barrel's Joe Baltimore helped roll out a Web-based warehousing system in just 45 days

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Many client/server users are confronted with an out-of-control storage management mess, with desktop PCs that often are stuffed with 1G byte or more of mixed corporate and personal information. Here's how companies are coping.



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Hope springs internal

PC Co. chief Stephenson takes turn at fixing long-term issues

By Jaikumar Vijayan

Ever ready to give it the old college try, IBM has selected a new man with a new plan to straighten out the IBM PC Co. In the latest recycling of some long-standing business initiatives, Robert Stephenson, the PC Co.'s senior vice president and group director, last week outlined a series of steps the company is implementing as it tries to revitalize its sagging PC business.

The moves come when IBM appears to have once again slipped back into single-digit revenue growth in the third quarter. Its PC shipments grew only 7% worldwide in the third quarter of this year, while shipments at rival Compaq Computer Corp. were up 15%, according to estimates from International Data Corp. (IDC) in Framingham, Mass.

IBM attributed its slow growth to sluggish sales growth in Europe and the U.S. and price cuts in its portable lines.

Complicating matters was the sudden resignation last week of general manager Bruce Claflin, a 22-year veteran credited with making IBM a player in the notebook business. He is leaving to run Digital Equipment Corp.'s PC business.

Stephenson is the third person to take the helm of the PC Co. in less than two years. His latest efforts, which include sweeping changes in manufacturing, distribution and branding strategies, hark back to similar initiatives by at least two of his immediate predecessors, Rick Thoman and Robert Corrigan.

Those efforts include the following:

- A global manufacturing shift to a largely build-to-demand

model to shorten product turnaround time. IBM will split its various PCs, servers and notebook products into three specific manufacturing categories based solely on demand and manufacturing priorities.

- A substantial paring of system configurations to reduce product clutter and user confusion. For instance, IBM will offer as standard only 75-, 100- and 133-MHz Pentium PC models.

- Moving development of the company's PC server business from the midrange server group back into the PC Co.—reversing an earlier decision.

- Setting up a special mobile computing and communications group to explore market potential in wireless communication and mobile markets.

"The question is not of figuring out what to do. The question is to do it," Stephenson said in

an interview before Claflin left. "We are talking of work that is under way." The first result of IBM's latest initiatives will be felt as early as the first quarter of 1996, he said.

"The objective is to make us a much more reliable supplier than we are today," Stephenson said.

"Though IBM is still following rather than leading, they are getting more in tune with price changes," said Eric Libow, manager of PC support at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla. He added that IBM is "finally getting the message" that it needs a more streamlined commercial product differentiation.

But some observers remained skeptical. "The basic problem is



Robert Stephenson is the third person to head the PC Co. in less than two years

IBM still hasn't figured out how to succeed in the mass-volume, low-margin, short product life cycle PC business," said David Wu, an analyst at The Chicago Corp. in New York.

Observers point to vendors such as Compaq and Hewlett-Pack-

ard Co., which have grabbed market share from IBM with aggressive price cuts, reliable availability and short product cycles.

"Even if you have a good story to tell — and IBM doesn't right now — with all these changes going on at the executive level, it is hard to communicate that story, let alone deliver on it," said Ted Julian, editor at "The Gray Sheet," an industry newsletter published by IDC.

Weiler goes over to Wang

Latest to exit Lotus

By Tim Ouellette

The latest recipient of another high-level Lotus executive departure is Wang Laboratories, Inc., which snapped up Robert K. Weiler barely a week after he left the IBM fold.

Weiler, who was senior vice president of worldwide sales and marketing at Lotus Development Corp., will lead Wang's growing imaging and workflow software business. Deborah Wesemer has taken over Weiler's duties at Lotus. She formerly was in charge of Lotus sales for North and South America.

"I decided to leave Lotus at the end of August," Weiler said. "I like being at a company where what you do day-to-day has a direct impact on the business," he said, referring to his desire to take on a leadership role.

Weiler said he didn't think his departure and other recent management exits would seriously affect Lotus' future.

Jim Manzi, chief executive officer at Lotus, resigned earlier this month; Chief Financial Officer Edwin Gillis left in August; and K. C. Branscomb, senior vice president of business development, resigned last week.

The rumor mill also had been churning about the prospects of Chief Technology Officer John Landry, but last week he was named strategic consultant to

IBM, advising both Lotus and IBM.

It took a change of focus at Wang—from its bankrupt minicomputer past to its software sales—to attract Weiler's attention.

"If you told me earlier when I was at Lotus that I would end up at Wang, I would have expressed some surprise," Weiler said.

The Billerica, Mass.-based firm hopes to double its software sales from \$21 million this past fiscal year to about \$40 million over the next year, said Don Casey, Wang's president and a former vice president of Lotus' spreadsheet division.



Robert Weiler will head up Wang's imaging and workflow business

Servers, workstations wait in wings for Intel's P6 chip debut

By Jaikumar Vijayan

A flurry of workstation and server announcements from major hardware vendors is expected to gild the launch of Intel Corp.'s next-generation Pentium Pro, or P6, chip this week.

In addition to the usual lineup of desktop suppliers such as Compaq Computer Corp., IBM, Hewlett-Packard Co., Dell Computer Corp. and Gateway 2000, Inc., vendors announcing P6 products will include some big iron stalwarts. Those are Unisys Corp. and Digital Equipment Corp., along with workstation maker Data General Corp.

The announcements are expected to be harbingers of a new generation of servers that will give users near-minicomputer functionality at aggressive prices, observers said.

The Pentium Pro announcement essentially enables Intel to take its "Intel Inside" campaign into the server arena, said James Garden, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

"The Compaqs and the Dells of the world will now be able to take Intel's commodity engine and build extremely price-competitive servers. Big Unix server vendors are going to be pum-

meled by this price competition from the bottom," Garden said. Analysts said high-end Pentium Pro-based server configurations will begin to compete with traditional minicomputer-class products by the end of next year.

That is the reason enterprise vendors are jumping on the bandwagon. If they don't, they will face severe competition from those who do.

The 32-bit Pentium Pro chip represents Intel's most ambitious effort to push its architectures deep into enterprise computing territory.

Toward this end, Intel will make available full-featured server motherboards and even complete reference system designs that vendors can use to quickly build symmetrical mul-

tiprocessing, massively parallel processing and clustered-server implementations.

Several mainframe vendors already build such systems, but technology such as Pentium Pro is expected to provide less expensive, more standardized ways to do it.

A slew of PC and big iron vendors will demonstrate early versions of these systems in New York next week.

Typical Pentium Pro Windows NT workstations, which will form the bulk of this week's announcements, will start at \$4,500. Servers will ship by the second quarter of next year.

Users will have other chip choices by the second half of next year. See page 41.

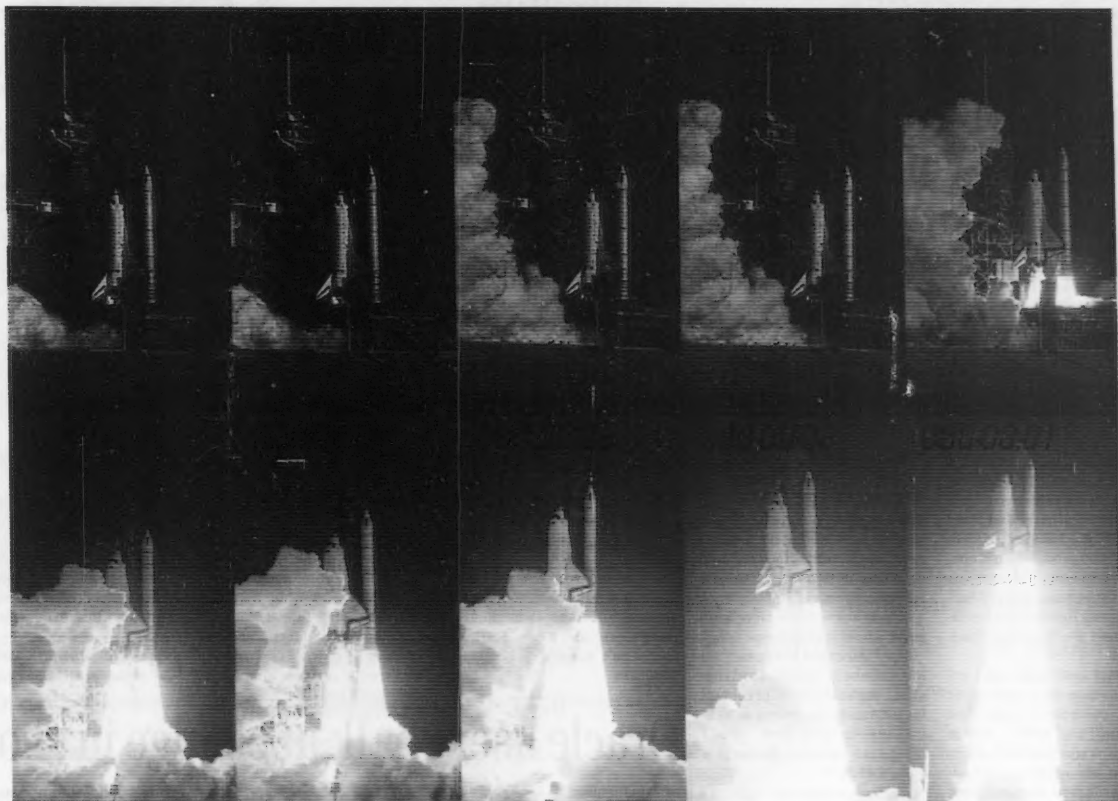
Corrections

worth \$1,724 today.

Due to an editing error, the stock price in the Microsoft time line [CW, Oct. 16] was misleading. It said the stock was \$21 and rose to \$87 during Microsoft's 20-year history. The stock actually split five times, so one original share is

Due to an editing error, a key benefit was deleted from a story about re-engineering at American Standard Cos. [CW, Aug. 7]. Redesign and demand flow programs have reduced the firm's inventory capitalization from \$600 million in 1989 to \$300 million today.

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News

Delay forces change in IBM storage plans

New Ramac on deck as Seascope slides

By Craig Stedman

The tide isn't coming in as planned for IBM's multiplatform Seascope storage devices, and the change is forcing a major course correction as the computer giant struggles to stay at the crest of the mainframe disk market.

Engineering delays on the much-anticipated Seascope architecture, which will connect multiple disk and tape controllers in a fault-tolerant ring that supports both mainframes and other servers, have caused a chain of events at IBM:

- Seascope deliveries have been postponed from the middle of next year to 1997.

- The delay is pushing IBM back to the drawing board to design a 360G-byte version of its Ramac mainframe disk array for shipment next year. Ramac work was supposed to end with a 180G-byte model that became available last week.

- IBM also is resurrecting plans to double the amount of data that its 3990 Model 6 disk controller can handle. The increase to 360G bytes was scrapped earlier this year to save IBM's storage budget for Seascope-related work.

Analysts said they don't expect Seascope and its Seastar storage controller to hit the beach until mid-1997 — which would be a year behind schedule — at the earliest. IBM already has lost its dominant position in mainframe disk shipments and is running neck and neck with EMC Corp. Rely-

ing on the aging 3990 controller for almost two more years will further test IBM's ability to retain customers.

"You have to give IBM credit for keeping the 3990 alive, but the bottom line is that it's an outdated architecture," said David Vellante, an analyst at International Data Corp. in Framingham, Mass.

Kept waiting

Barnett Banks, Inc. in Jacksonville, Fla., has almost a terabyte of Ramac capacity installed and expects to buy an equal amount of Ramac 2 by the end of next year.

But Seascope's delay will force the bank to postpone its plans to merge its mainframe and Unix storage under a single management scheme, said Michael Pully, manager of resource management at Barnett's information systems unit.

"Strategically, what we'd like to do is have one central location for all of our data," Pully said. "This definitely pushes some of our time lines off, and that costs us money from a management perspective."

Other users were more sanguine about the Seascope delay. "If they got it [out next year], I'd love to have it," said Gerard Higgins, assistant vice president for information services at Nynex Corp. in New York. "But I think I can live with [Ramac] for quite a while."

Storage issues affect users from mainframes on down. See Closer Look, page 39.

Novell to feed NetWare's Internet-hungry users

By Kim S. Nash

Novell, Inc. users holding their breath for NetWare-based World Wide Web servers can exhale.

The vendor plans to unveil tomorrow a series of Internet products based on source code licensed from a start-up in Bedford, Mass., according to sources familiar with the deal.

Novell will rename and resell 10-month-old American Internet Corp.'s SiteBuilder Web server starting in the first quarter of next year, the sources said. A Novell official confirmed that the Provo, Utah, firm will unveil Web products at the Internet World show in Boston this week but declined to provide further details.

Ignored no more

The estimated 45 million NetWare users have been largely ignored when it comes to Web technology, analysts said.

Framingham, Mass.-based Process Software, Inc. also plans to ship a Web server for NetWare before year's end. But other Web software vendors, including Netscape Communications Corp. and Open Market, Inc., don't offer any NetWare products.

Novell itself is late in providing Web capabilities to its bread-and-butter users, said Stan Lepeak, an analyst at Meta Group, Inc. in Stamford, Conn.

NetWare users "want to get on the 'net, but they don't want to have to drag another operating system in to do it," Lepeak said, referring to numerous Web products available for Unix and

the chance to beta-test American Internet's products, he said.

Boston Edison has experimented with Unix and NT Web servers for a small information systems application "to get a feel for the Web while we figured out how to get there with NetWare," he explained.

SiteBuilder, which was announced last week, runs as a

Webware

Novell plans to resell American Internet's SiteBuilder Web server early next year; American will sell the product beginning in December

Product:	SiteBuilder
Platforms:	NetWare 3.11, 3.12 and 4.1
Administration:	Can be managed from NetWare, DOS or Windows PCs
Price:	\$1,495 (\$1,995 with application development tools from Vermeer Technologies in Cambridge, Mass.)

Microsoft Corp.'s Windows NT.

Boston Edison Co., for example, has had nowhere to turn to fulfill its plans to build internal Web sites for human resources, news posts and other applications, said John Dubiel, manager of planning and technology.

The utility, which runs 100 NetWare file servers, jumped at

NetWare Loadable Module on Novell's operating system, Version 3.x and higher. It was written for NetWare, unlike the rival product from Process Software, which is a port of a Unix version of Process' Purveyor server.

Help wanted on the Web, plus Halloween tips. See page 54.

Oracle users balk at change in show

By Dan Richman

Some users and business partners of Oracle Corp. are worried that the company's quest for customer accounts may wreck the annual education-oriented International Oracle Users Week (IOUW).

A marketing event called Oracle Open World is scheduled to make its U.S. debut next fall in San Francisco at or about the same time as IOUW. "Everyone would lose if the two events started to compete with each other," said Mike Corey, chairman of the International Oracle Users Group-Americas, the national Oracle user group.

Oracle Chief Executive Officer Larry Ellison confirmed that IOUW and Open World will be combined next year but said, "We are not doing away with user week at all."

Pairing the events might work out fine, or it might limit IOUW's educational content and diminish its independence from Oracle's corporate agenda, said several user group officials who asked to remain anonymous.

Conflict of interest?

"Oracle already goes ballistic if we make presentations on PowerBuilder [a tool used by Oracle developers but owned by rival Sybase, Inc.] or on older versions of its products," said one user group official. "If Oracle were in control of IOUW/Open World, it would probably eliminate those presentations."

Databases

Zack Nelson, Oracle's vice president of marketing, said the company wants to sponsor a single, national event for the national user group and other Oracle user groups, such as applications users. He said the user

group would retain control of presentations relevant to them.

Oracle user group officers say IOUW is an intensive, education-oriented gathering of committed Oracle users who pay about \$1,000 each to attend the weeklong gathering. About 8,000 people attended IOUW in September, and many stayed for the entire conference.

Oracle Open World has been a marketing-oriented event held without the user group's input. For the past few years, it has been held in Japan and attracted as many as 80,000 people.

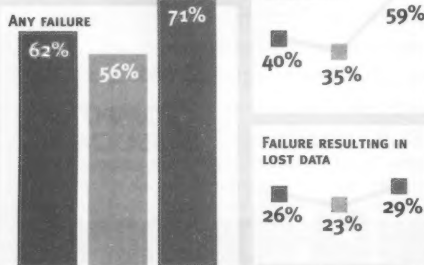
Even some of Oracle's vendor partners said replacing IOUW with Oracle World would be a mistake.

"Stressing quantity of leads over quality isn't the game anymore," said Cameron Jenkins, vice president of marketing at Accucol, Inc. in San Diego, an Oracle business partner.

Feel the pain

Users of mainframe disk arrays report different types of failure rates

■ EMC ■ IBM ■ StorageTek
Base: 77 EMC sites; 81 IBM sites;
17 StorageTek sites



Source: Xephon PLC, Newbury, Berkshire, UK

Database Performance

The TPC-C™ benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance. On July 24, Hewlett-Packard published the record-setting 5369 tpmC Oracle7 benchmark.

ORACLE7
BEST: 5369 tpmC

Informix
BEST: 3534 tpmC

Sybase System 10
BEST: 1708 tpmC

ORACLE7 HP 9000 T500

5369

ORACLE7 HP 9000 K410

3809

Informix Sun SPARCcenter 2000E

3534

Informix AT&T 3555

3313

Informix AT&T WorldMark 4100S

2692

Informix Bull ESCALA Rack R201/8

2660

Informix HP 9000 K400

2616

Sybase Digital Alpha 2100 4/275

1708

Informix Bull ESCALA Rack R201/4

1563

Sybase Compaq ProLiant 4500 5/100

1517

Informix NEC UP 4800/690

1489

Informix DG AV 9500+

1416

Sybase HP 9000/800

1403

Sybase IBM RS 6000 PowerPC J30

1298

Informix NEC UP4800/675

1245

Sybase Sun SPARCserver 20

1064

Informix Fujitsu/ICL Superserver K474s

1002

Sybase IBM RS 6000 390

902

Informix NEC UP 4800/650

900

Informix SNI RM 400 Model 630

874

These are the top 20 Oracle, Informix and Sybase TPC-C benchmarks as of September 29, 1995.

Oracle7's superior OLTP performance is the result of an advanced architecture with features like non-blocking consistent queries and unlimited row-level locking—features that Sybase and Informix don't have. For proven scalable performance on SMP, clustered and massively parallel systems, call Oracle at 1-800-633-1071, ext. 8101.

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'net providers will overhaul network

Fast switches are in; router role is recast

By Bob Wallace

Explosive growth in Internet use has spurred demand for higher-speed access pipes to the 'net, forcing major Internet service providers to install high-speed switching systems.

That was the impetus behind last week's announcements from UUNET Technologies, Inc. and Netcom On-Line Communications Services, Inc. that they will overhaul their router-based networks in favor of Cascade Communications Corp.'s high-speed switches.

Analysts lauded the strategy, claiming users have everything to gain and nothing to lose.

"The switch approach lets Internet service providers easily scale [up] their networks and offer reliable services, whereas routers typically don't scale well and can cause problems transmitting overhead," said John Morency, a principal at The Registry, Inc., a consultancy in Newton, Mass. "Cascade switches support higher performance than even high-end routers. And by optimizing their networks, Internet providers realize savings that can be passed along to users."

Problems with routers in large networks aren't unusual. It was a router anomaly that caused a networkwide brownout on the Internet in late August [CW, Sept. 11]. Lending further credibility to the switch approach, MCI Communications Corp. opted for Asynchronous Transfer Mode switches rather than high-end routers to form the backbone of its recently announced network for the supercomputer centers, which were the first tenants on the Internet.

Users said Internet providers have no choice but to move to the higher-speed switched network architecture.

"This is a must-do for providers because, from a user perspective, the winning provider will be the one that delivers the service at the quickest speed and the lowest cost," said Barbara Maaskant, director of informa-

tion services at the Rollins School of Public Health at Emory University in Atlanta. "Users are already showing signs of becoming frustrated with bottlenecks and bandwidth limitations."

Ongoing construction

Bandwidth on the Internet can be compared to the country's highway system. As more and larger on-ramps have been added, and as traffic has increased, the need to expand the highways has become a pressing issue.

The Internet comprises large routers linked by several T1 lines and some 45M bit/sec. T3 lines. The Cascade switches will support multiple T3s, next-generation 155M bit/sec. links next year and 622M bit/sec. links in 1997.

The tripling of link speed and installation of the Cascade switching systems addresses the fast-growing use of the Internet as a business tool.

In fact, Internet service providers have expanded their networks to keep pace. Netcom surged from 50 network entry points in January to 200 in September.

UUNET's network offers users local access from 100 U.S. cities, and the company plans to reach the Internet from 300 cities worldwide within the next two years.

Performance Systems International Network (PSINet) already is installing Cascade switches in its network. Analysts said other service providers still rely on the router-based approach, but their migration to the switch-based approach is inevitable.

"You can get away with one or two high-end routers if your network isn't too large," said Christine Heckart, director of broadband consulting at TeleChoice, Inc., a Verona, N.J., consultancy. "But once an Internet provider's network approaches the size of UUNET's or PSINet's, you need switches to consolidate traffic and control [WAN] costs."



A help wanted cooperative may bump up Web usage. See page 54.

"We're looking to increase our pipes to the Internet because our users want more bandwidth. We can't tolerate bottlenecks."

— Barbara Maaskant, IS director, Rollins School of Public Health, Emory University

Phone service jockeying continues

AT&T Corp. plans to ask Connecticut regulators to let it offer local telephone service for business and residential customers starting early next year as part of a nationwide push into local markets. The AT&T filing is part of a larger push for position as Congress moves toward a deregulation of phone service that would allow regional Bell operating companies to enter long-distance markets and let interexchange carriers invade local markets. AT&T filed for similar permission in California Sept. 1, and it has already won permission to provide service in Chicago and Grand Rapids, Mich. Gaining regulatory approval is a minor hurdle compared with hammering out the details with the local phone company. For example, AT&T has been unable to reach an agreement with Ameritech to allow delivery of service in Chicago and Grand Rapids.

Notes 4.0 enters final beta

Lotus Development Corp. has released the final beta version of Notes 4.0 to 10,000 business partners. This is the final beta phase for the product, which is set to ship by year's end.



The Cambridge, Mass., division of IBM also announced that Notes:News-land, a service for delivering business publications to Notes users, will be offered on AT&T's Network Notes, the IBM Global Network and WorldCom, an international Notes network.

Cisco to buy NTI

Cisco Systems, Inc. last week continued its buying binge with an agreement to buy Network Translation, Inc. (NTI), a Palo Alto, Calif.-based maker of address translation and Internet firewall equipment. No sum was specified.

Libel suit dropped

New York investment firm Stratton Oakmont, Inc. last week agreed to drop its \$200 million libel suit against Prodigy Services Co. in White Plains, N.Y. In a carefully worded statement, Prodigy said it was "sorry if the offensive statements" posted on Prodigy's on-line service harmed the plaintiff's reputation. However, Prodigy will still try to overturn the New York court's prior ruling that Prodigy is a publisher liable for its on-line content.

Netscape cuts prices

Mountain View, Calif.-based Netscape Communications Corp. cut its prices by as much as 57% on its Unix-based and Microsoft Corp. Windows NT-based World Wide Web servers last week. The NT version of Netscape's Commerce server went from \$1,495 to \$1,295; the Unix version dropped from \$5,000 to \$2,995. Netscape's Communications server for NT was reduced from \$795 to \$495, and the Unix version fell from \$2,995 to \$1,295.

Maxtor in buyout discussions

Troubled hard disk maker Maxtor Corp. revealed it is in acquisition discussions with Hyundai Electronics Industries Co. Hyundai Electronics is a subsidiary of Korea's Hyundai Business Group, which owns 37% of the San Jose, Calif.-based company. Separately, Maxtor said it lost \$44.5 million on sales of \$281.4 million in its second fiscal quarter. It lost \$54.7 million on sales of \$174.4



News Shorts

million in the same quarter last year.

KnowledgeWare suits settled

Sterling Software, Inc. in Dallas said last week it had settled a class-action lawsuit filed by shareholders against KnowledgeWare, Inc. for \$17 million in cash and stock. Sterling acquired KnowledgeWare in November 1994, but the settlement will be paid by KnowledgeWare's insurers and from stock placed in escrow at the time of the merger.

MGM's CIO calls it quits

Edward N. Altman, Metro-Goldwyn-Mayer, Inc.'s vice president of MIS since January 1994, will leave the company Nov. 3. Altman said he has completed his mission at the Santa Monica, Calif.-based movie-maker and will begin looking for a new information systems position in the entertainment industry.



MGM's Edward N. Altman

Digital info via TV

The Intercast Group, a consortium led by Intel Corp. of hardware manufacturers, software developers, broadcasters and cable companies will soon provide PC users a way to receive digital information, such as software, Web pages and magazines, over a broadcast television signal. En Technology Corp. in Keene, N.H., plans to ship the first products based on the Intercast Group's technology by January.

EMC buys McData

EMC Corp. in Hopkinton, Mass., has signed a deal to buy McData Corp., a maker of network switches for connecting host systems and storage devices in data centers. Ironically, McData's main product is a switch for IBM's Escon fiber-optic interconnect, and IBM is EMC's archival in the mainframe disk market.

EMC to open up Symmetrix

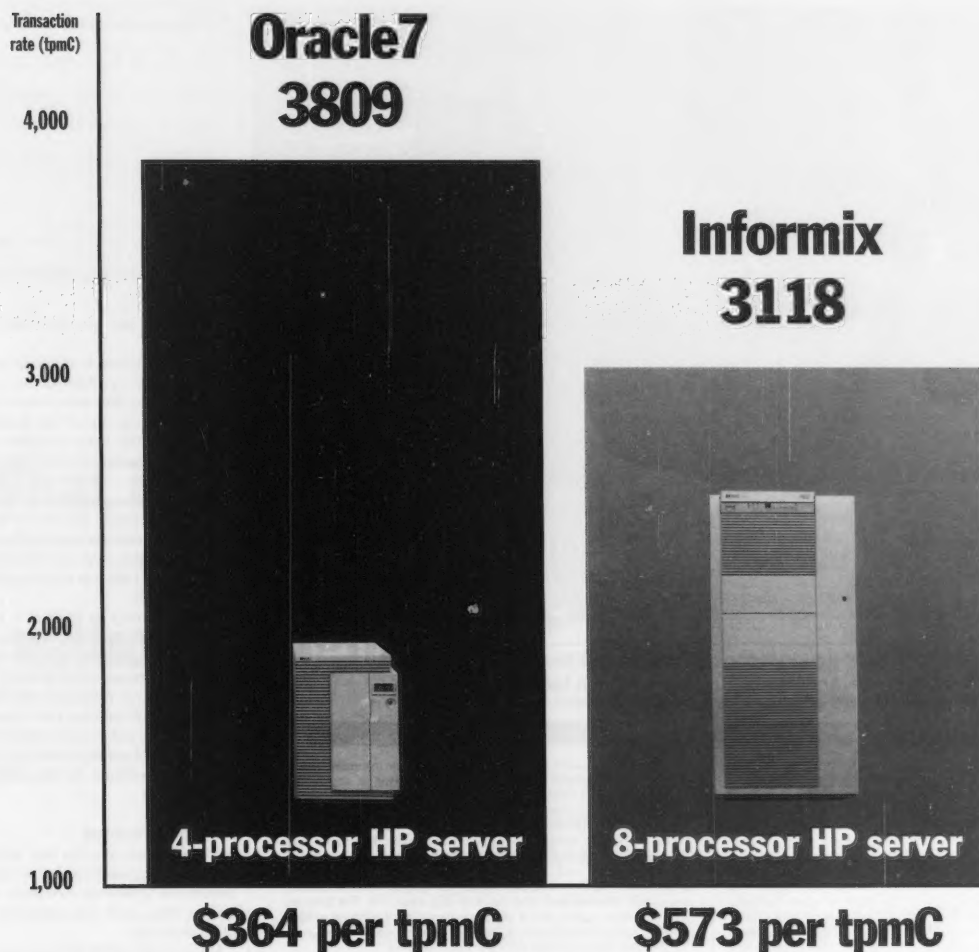
EMC Corp. in Hopkinton, Mass., next week will open up its Symmetrix 5000 mainframe disk arrays to data from pieces of not-so-big iron, sources said. Thanks to a new SCSI interface, Symmetrix customers will be able to attach both mainframes and Unix systems to a single array. However, storage capacity will have to be partitioned between the two boxes because EMC doesn't enable them to share the same data.

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DG's Intel move gets user nod

By Neal Weinberg
WASHINGTON

Data General Corp. drew a technology road map last week that takes the company from the dead-end Motorola, Inc. 88000 chip to the fast lane of symmetrical

multiprocessing servers based on Intel Corp. processors.

DG rolled out its first Intel-based products last week: Pentium-based Avilion departmental and enterprise servers. It will add Pentium Pro processors early next year; machines with commodity,

four-processor motherboards from Intel by midyear; and systems that link multiple motherboards by the end of 1996.

Attendees at the North American Data General User Group here said they wouldn't necessarily place their orders at the show, but they were glad that an

upgrade path had been cleared.

Larry Spanier, manager of information systems at E. R. Moore Co. in Chicago, said he has stayed with DG's older MV systems because of the expense involved in moving his custom applications used to design items such as choir robes.

"What I heard today is very significant," Spanier said. Because DG's switch to Intel opens up a new world of applications, Spanier said he is leaning toward



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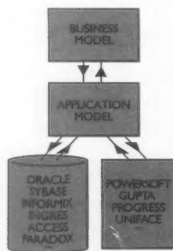
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COMPUTERWORLD OCTOBER 30, 1995

Data General goes Intel

Data General goes Intel	
PRODUCT	AVILION 5800 (ENTERPRISE SERVER)
Chip	133-MHz Pentium
Memory	2G bytes
Platforms supported	Windows NT, DG/UX
Price	\$70,000 (two-processor system); \$160,000 (eight-processor system)

the new Avilions. "It's not if, but when," he added.

Similarly, James B. O'Loughlin, director of IS at L. S. Starrett Co. in Athol, Mass., said he has been wrestling with the issue of moving off his proprietary MV system. "We know we have to move forward," O'Loughlin said. "But what's the carrot?"

The IS director said the new manufacturing applications written for the Intel architecture could be the deciding factor. DG is "paving the way for the future; the only thing is I have to catch up with it," he added.

Not everybody is thrilled with DG's move to Intel, however. "For me, it's a problem," said Eric Raskin, president of computer services at Listworks Corp. in Pleasantville, N.Y. Raskin said he worries that it will become even more difficult to obtain software for his MV hardware. "It's like pulling teeth to get people to develop software for the 88000 chip now," he said.

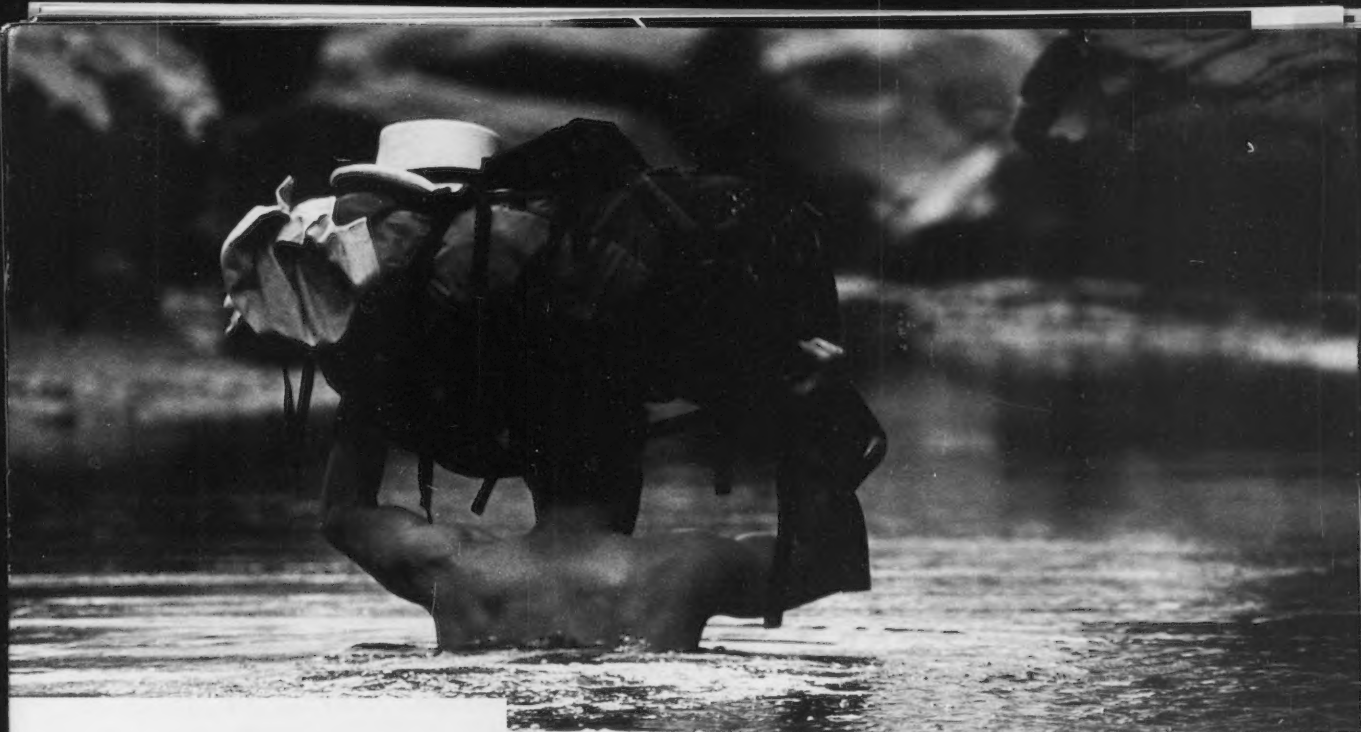
Receptive crowd

But the overall reaction has been positive, said Thomas Bounds, president of Hometown Computer Products, Inc. in Magee, Miss., and vice president of the DG user group.

Many of the older MV customers are "not in as big a hurry" to move off their platform, Bounds said. But newer customers will be moving rapidly to the Intel-based Avilions, especially because the new systems run Microsoft Corp.'s Windows NT.

DG says its new servers will run more than 15,000 applications, including all the leading database and enterprise software. That includes 7,000 shrink-wrapped Windows NT applications.

Users were also pleased with DG's financial results, which were announced last week. Snapping a long losing streak, DG turned a \$1½ million profit in its fourth quarter, with revenue increasing from \$293 million to \$313 million.



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News

AT&T stresses *multimedia*

Single platform to incorporate video, graphics, apps

By Neal Weinberg

AT&T Corp. today will outline a broad vision for integrating voice and data networks into one multimedia system based on Asynchronous Transfer Mode (ATM) technology.

The idea is to enable individual PC users to begin and end videoconferences with the ease of a phone call and let them store and manipulate the contents of those sessions as easily as they store and retrieve data now.

In the first step of a long product rollout to achieve that goal, AT&T's Global Business Communications System unit will unveil a Multimedia Communications Exchange server that links phone switching equipment with the local data network. The name of the entire

product family is BusinessWorks.

The company will also announce communications middleware that will allow existing client/server applications to run on the new servers, according to Howard Hecht, an analyst at Decisis, Inc. in Sterling Va.

"This is another level beyond anyone's current product," Hecht said. "This is the first time anyone has taken the 'multi' part of multimedia to heart." Instead of focusing simply on video, AT&T is incorporating audio, graphics and applications into one platform, he said.

Pricey plan

"It sounds interesting, and it sounds expensive," said Helen O'Connor, vice president and director of telecommunications at

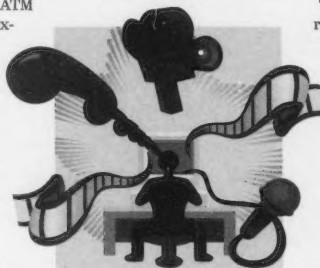
First Albany Corp. in Albany, N.J. "If you have a communications server hooking up to ATM for video, we're talking extensive bandwidth, and that usually equates to expensive costs."

O'Connor said she already has videoconferencing from PictureTel Corp. that runs on inexpensive Integrated Services Digital Network (ISDN) lines.

But Sarah Dickinson, an analyst at Personal Technology Research, Inc. in Waltham, Mass., said AT&T is going far beyond just videoconferencing. The company is developing "a LAN/WAN gateway for extending client/server to the wide-area network."

And while ISDN represents one alternative to ATM, the consensus of network managers is that "ATM will rule the world," said Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass.

AT&T is laying out a road map for "how you get there from here," she said. The company is telling corporate accounts that



AT&T's multimedia plan

THE GOALS: To let users easily begin and end videoconferences and quickly store and manipulate the contents of those sessions.

THE MEANS: A server that links users' switching gear with the local telephone network and middleware that lets existing applications run on the new servers. This is accomplished via ATM networks.

they don't have to replace their private branch exchange telephone switches or their data servers. They can plug both systems into this new communications server, which will become an essential ATM switch, Cochran said.

"This is a big step, and it's the right direction," Cochran said.

"They are setting up a framework for how you would do business in the future."

Eye on the future

Robert Larson-Hughes, a partner at McGladrey and Pullen, a Minneapolis-based accounting and consulting firm, said he is looking forward to being able to merge the data and voice networks at the company's 70 locations.

"The place we would really save is on the amount of people effort it takes to manage and maintain such a network," Larson-Hughes said.

He added that his company is extremely interested in videoconferencing and is looking to add Intel Corp.'s ProShare videoconferencing system to Network Notes, AT&T's version of Notes.

Win 95 bug fixed

Client security gap affects few users

By Laura DiDio

Microsoft Corp. acknowledged last week that it discovered, and has since fixed, a security problem with the file and printer sharing facility in Windows 95 clients.

The potential security loophole could have affected, and actually could still affect, a small percentage of Windows 95 clients attached to Windows NT and Novell, Inc. NetWare-based servers.

"Businesses that turned on the Windows 95 File and Printer Sharing capability could have unwittingly created a situation where unauthorized network users or hackers could gain read-only access to Windows 95 PCs, including sensitive corporate data," said one network administrator at an East Coast financial institution, who asked not to be identified. The administrator became aware of the potential flaw two weeks ago.

The fix for the security shortfall is a set of free updated net-

work drivers, which Microsoft released on various on-line services last week, said Windows 95 product manager Rob Bennett. Those services include CompuServe, America Online, Prodigy and The Microsoft Network. Users can also call Microsoft's FastTips line at (800) 936-4200.

Bennett emphasized that only those users who physically enabled the File and Printer Sharing capability in Windows 95 are affected. "To the best of

our knowledge, few, if any, users were affected," Bennett said.

To be susceptible to the security flaw on NetWare and Windows NT Server networks, users would have to configure their Windows 95 PCs to share files and printers with other network users deploying File and Printer Sharing. They would also have to manually enable the remote administration feature or install Microsoft Remote Registry Services, Bennett said.

Microsoft also issued an update last week to correct a similar problem with Windows-based networks and Samba Corp.'s Unix shareware net-

work client called the Server Message Block (SMB) client. The bug in the SMB client lets users send illegal networking commands.

"The Samba client is the only known SMB client at this time" that has the problem, Bennett said. "But again, users or network administrators would specifically have to configure their systems and know the exact steps to send the illegal commands over the Samba shareware."

Another network headache, storage management, gets a Closer Look. See page 39.

Microsoft offers corrective measures

To determine if your business enabled the File and Printer Sharing facility, choose the Networks Option in the Windows 95 Control Panel and check the dialog box.

If "File and Printer Sharing" appears in the dialog box, it is installed. Users should then take the following steps to update multiple desktops on a NetWare network:

- If you haven't installed Windows 95 or are using a server-based setup: Copy the file "nwserver.vxd" from the \\Windows\System directory to the directory on the network.
- If Windows 95 is already installed and runs locally on client desktops: Click on the heading below, "Updated driver for File and Printer Sharing for NetWare Net-

works." Save the file in a publicly available directory.

- For automated distribution, choose one of the following options: Either incorporate the nswrvupd.exe that you download into a network log-in script or create a run-once policy using system policies or use Microsoft's Systems Management Server or another automation tool.

—Laura DiDio

Informix to buy tool maker

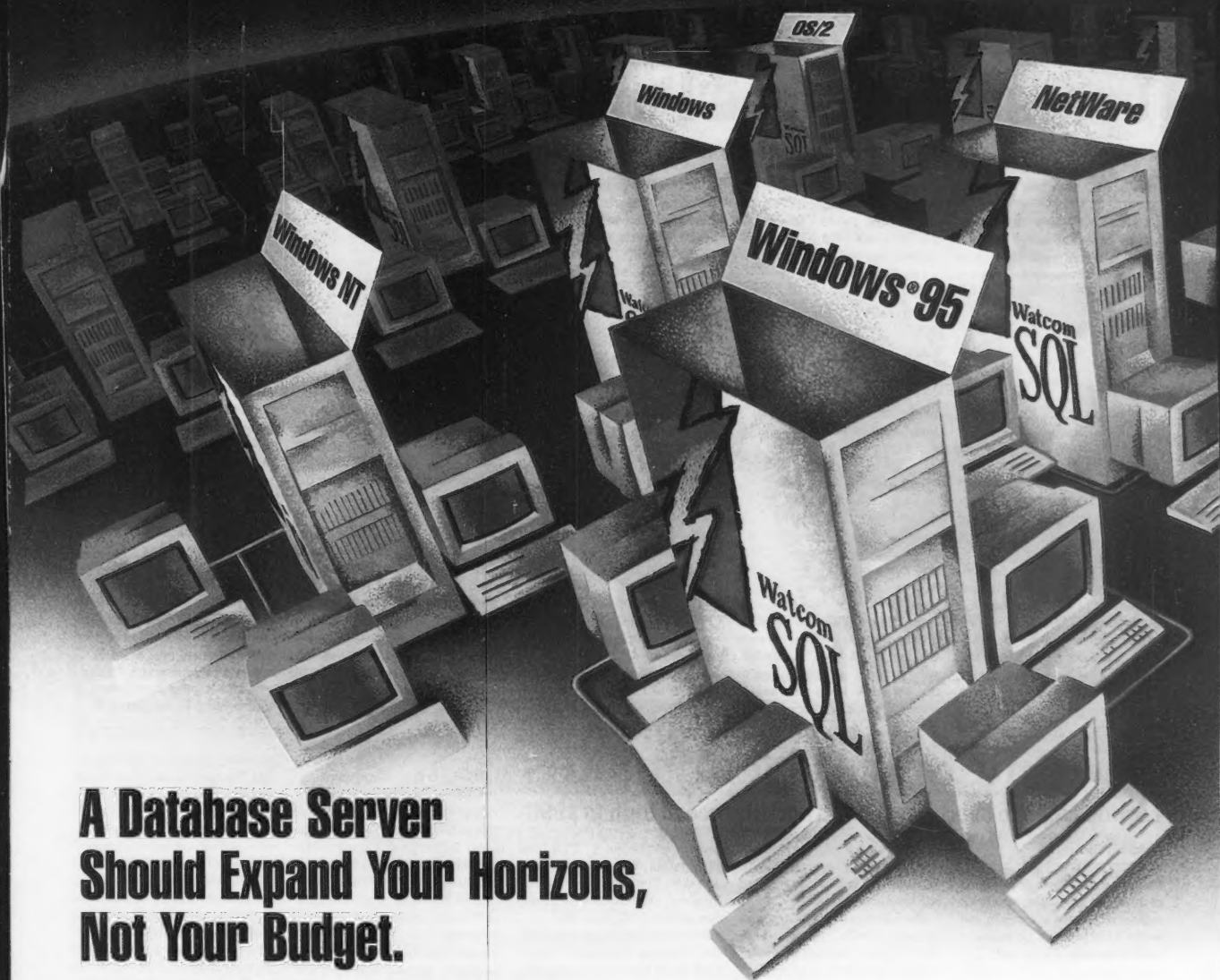
By Dan Richman

Racing to keep up with the competition, Informix Software, Inc. last week said it will buy Stanford Technology Group, Inc., a multidimensional-analysis tool maker in San Francisco.

Stanford Technology makes Metacube, a product that lets users view data in three or more dimensions — such as by time, place and product — rather than the two dimensions that relational database management systems typically allow (see related story, page 61).

Informix's purchase, to be completed as a stock swap, follows Sybase, Inc.'s recent purchase of similar technology and Oracle Corp.'s acquisition of a company specializing in an alternative technology based on a multidimensional database management system.

Informix will integrate some features of Metacube into its RDBMS, said Marianne Elkholy, Informix's director of data warehouse marketing. She wouldn't say when the integration will take place or which features would be integrated.



A Database Server Should Expand Your Horizons, Not Your Budget.

Presenting Watcom SQL, the industrial strength database server for simple and affordable widespread deployment of PC client/server applications. Watcom SQL's advanced technology offers unparalleled simplicity of operation and performance, making it ideal for workgroup, desktop and mobile applications — from head-quarter's departments to remote branch offices to mobile field personnel on the go.

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Big Performance. Small Footprint. Not only is Watcom SQL powerful, it's incredibly efficient as well. Because it was designed for PC environments, it minimizes its use of disk and memory — just 4 MB of disk and less than 1 MB of memory. And Watcom SQL also runs quite comfortably on the same

machine as an application — particularly important in mobile, standalone and peer-to-peer networks. Of course, on advanced servers, Watcom SQL shines by taking full advantage of both increased memory and RAID storage.

Yes, The Price Really is That Low. Watcom SQL is priced to make widespread deployment affordable. A 6-user server is only \$795*. And for volume deployments, our "Gold Disk" licenses offer significant savings.

So, though your budget may not be limitless, your horizons are with Watcom SQL — from one server to thousands on Windows, Windows 95, Windows NT, NetWare or OS/2. With hundreds of thousands of servers already installed, Watcom SQL is the proven choice for widespread, industrial strength deployment.

Expand your horizons. Call us today for the opportunity to try Watcom SQL 4.0 free for 30 days, or to reserve your seat at a free half day seminar on "Cost-effective Widespread Deployment of Client/Server Solutions" in a city near you.

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News

Users: Revamped Paradox 7 easier to use

Borland's latest effort could recapture lost market share

By Cheryl Gerber

If Microsoft Corp. hasn't already stolen the show, then Borland International, Inc. may have a shot at capturing some of the desktop database market with the Windows 95 and NT version of Paradox. Slated for introduction today, the product will ship in December.

By all accounts, Borland has eradicated in the 32-bit beta version of Paradox 7 every weak point in its predecessor, Paradox 5. "It's a huge product overhaul," said Dan Ehrmann, a consultant and president of Kallista, Inc. in Chicago and a Paradox 7 beta tester.

Beta testers said the chief improvement in Paradox 7 is that it is easier to use. Borland's extensive use of Experts, which are equivalent to Wizards in Microsoft's Access, has made the product easier for less-experienced users as well as developers to use. The import/export

process, electronic-mail merging and the formation of charts, tables and reports are examples of more than a dozen processes that have been automated by Experts.

Paradox 7 also touts more than 100 developer productivity tools for visual and rapid application development. The 32-bit version is integrated not only with Novell, Inc.'s PerfectOffice suite, with which it is bundled, but also with Microsoft's Office 95.

Better than Access?

Some Paradox beta testers are Access users. They said they couldn't help but compare the two database products. "Paradox 7 is a better upgrade than Access 7, and the reason is forward compatibility," Ehrmann said. The transition to Paradox is easier because the current version of Access has undergone a language change, while the Paradox language hasn't changed in the 32-bit version.

But some who prefer Paradox to Access said, nonetheless, that Microsoft has irreversibly captured the market. "As good as Paradox 7 is, it might be difficult to sustain applications written in it [if the number of developers drops in the future]. It's tough to find a Paradox developer these days. Many of them have moved to Access, PowerBuilder or Delphi development," said Frank Andersen, a systems analyst at Peter Pan Seafoods, Inc. in Seattle and a Paradox 7 beta tester.

However, some beta testers said finding Paradox developers depends on where you are.

"Seattle is a tough spot for anybody who's not Microsoft," said Charlie Russel, systems administrator at New United Motor Manufacturing, Inc., a General Motors/Toyota joint venture in Fremont, Calif. "I have no trouble finding Paradox developers here."

Borland has established a loyal base of Paradox developers since it released the product in

Paradox vs. Access		
FUNCTION	PARADOX 7	ACCESS 7
Compatibility with previous Windows 3.x version	Full	Limited
Native links included	Microsoft's SQL Server, ODBC, Oracle, Sybase, Interbase	Microsoft's SQL Server, ODBC
Integration with suites	Microsoft's Office, Novell's PerfectOffice	Microsoft's Office

1985. And the Borland developer community has continued to grow, said Richard Gorman, vice president of Borland product marketing and management. Attendance at the Borland developer conference in San Diego in August — 2,200 developers — was up 30% from 1994, he said.

Nonetheless, one analyst said times could be tough for Borland. "It'll be hard for a standalone database to beat a database bundled in a suite as successful as Microsoft's," said Chris Le Tocq, principal at Sof-Tracks Software Research in Los Altos, Calif.

"Access is kicking serious

butt in the desktop database market. It has grabbed the focus away from Borland. Paradox has to grab attention [back] by delivering differentiated features and distinguishing itself as more geared to the developer community," Le Tocq said.

However, when Paradox 7 arrives in PerfectOffice 7 for Windows 95, the database will finally compete with Access on a level playing field. But the delay of PerfectOffice 7 until the first quarter of 1996 could delay that competition.

DB2 is going client/server, or so IBM says. See page 61.

The difference a year makes

Laptop sales to overcome slump and hit record high in 1996

By Mindy Blodgett

Despite a slowdown in the pace of laptop shipments, analysts expect explosive growth in the sector next year as more users turn to notebooks as their primary computer and vendors make Pentium chips standard in the mobile units.

Demand is also expected to climb as high-end features trickle down into the value end of the market. That could push laptop growth to the highest numbers in the past couple of years, analysts said, though they declined to name specifics.

But in the meantime, recent numbers indicate that laptop shipment growth is surprisingly sluggish, especially when compared with periods earlier this year and last year.

"But once we are over this hump, we just expect outrageous growth," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif.

Dataquest predicts that laptop shipments will grow just 25% this year, compared with 41% in 1994.

International Data Corp. in

Framingham, Mass., predicted that this year's overall growth will be about 24%, down from an earlier estimate of 29%.

Manufacturers said demand for laptops with Intel Corp. Pentium chips is not the problem. Indeed, users are clamoring for machines based on the faster chip.

Demand is there

Kevin Danehy, manager of workgroup applications development at Millipore Corp. in Bedford, Mass., said he will soon recommend that his company buy new Pentium-based computers for a few hundred users.

"We are definitely moving into Pentiums. That is the way to go," he said. "But we are waiting to see prices go down. Now we know how Intel works, that they space their chip announcements and then prices go down. We're waiting until the first or second quarter next year."

Much of the softening in the growth rate is due to the engineering difficulties inherent in installing the faster Pentium chips into portables, industry observers said. The faster chip

creates problems — with heat dissipation, for example. The 120-MHz Pentium was delayed by about a month due to a minor design flaw [CW, Sept. 11].

Heddy Baker, a spokeswoman for Compaq Computer Corp., said there have been complica-

tions in redesigning the laptops to include the Pentium chips.

Robert Stephenson, senior vice president and group executive at the IBM PC Co., said technical difficulties in implementing the new chips have slowed IBM notebook shipments.

Tom Scott, general manager at Toshiba America Information Systems, Inc., called the demand for Pentium laptops "insatiable." He said that since his

company has been working with Intel for more than a year on the transition to Pentium chips — and was the first notebook manufacturer to start the switch-over — Toshiba has been meeting most of its shipment orders.

Still, Toshiba is having some difficulties meeting demand, he said. The shipment slowdown, coupled with the high demand, is likely to prevent a price war anytime soon.

Toshiba rolls out the notebooks



Key features in Toshiba's new Satellite Pro 410 Series

- 90-MHz Pentium processor; 8M bytes of RAM
- Slots for two Type II PC cards or one Type III card
- 7.1 pounds; with modular CD-ROM drive, weighs 7.4 pounds

Toshiba continued its product rollout last week with a line of Pentium notebooks aimed at the sub-\$5,000 segment of the market.

Although he declined to reveal exact pricing, Len Herbstman, senior product manager for the new Satellite Pro 410 series, said the 410CDT, with an active-matrix color screen, will cost less than \$5,000. The 410CS, with a dual-scan color screen, will cost less than \$4,000.

Pricing will be available in early November, Herbstman said.

Toshiba is waiting to an-

nounce pricing on the Satellite Pro series and the new high-end Tecra 700 notebook series "because we wanted to see where our competitors are putting pricing," said Tom Scott, general manager at Toshiba.

Toshiba's new Satellite Pro models have a 11.3-in. screen, a 90-MHz Pentium processor, support for two Type II PC cards or one Type III PC card, a removable floppy disk drive and CD-ROM module and 8M bytes of RAM.

The new systems will ship in November.

—Mindy Blodgett

FCC to keep tight rein on frame-relay pricing

But cost to users likely to remain about the same

By Neal Weinberg

If you're considering frame-relay service for sending data across a wide-area network and you're hoping rates will drop when the telecommunications carriers file formal rates with the Federal Communications Commission later this year, don't hold your breath.

If you are a large user adept at power negotiations, now is the time to ink a deal for frame-relay service. But don't forget a clause that lets you renegotiate in the off chance the new rates are lower.

And if you are a smaller company just window-shopping, it may make sense to wait for the new rates to come out so it will be easier to compare prices.

Those are the recommendations of telecommunications analysts who are trying to predict the effects of the FCC's

N.J., said there is more to a frame-relay contract than price. Carriers offer managed services that include value-added features such as network management, service and repair.

"Price is very important, but it's not necessarily the only or most important factor," Smith said.

The FCC ruled that frame relay, which breaks up transmissions into discrete packets, is a basic data transport service rather than an enhanced service, and is

thus subject to tariff regulation.

The FCC also said the carriers must unbundle frame-relay service from frame-relay equipment.

OLAP might not need multidimensional databases anymore. See page 61.

Buyer beware

What to look for in the fine print when purchasing frame-relay service

- Make sure the frame burst size is appropriate for your needs
- Check the frame discard rate to ensure essential data is not lost
- Be sure the frame delay rate is adequate in case of congestion

recent ruling that carriers must file formal frame-relay rates in the next 60 days.

Currently, frame-relay service, unlike long-distance service, is unregulated. Carriers voluntarily publish list prices that are mere jumping-off points for hammering out customized contracts, according to Rick Malone, an analyst at Vertical Systems Group in Dedham, Mass.

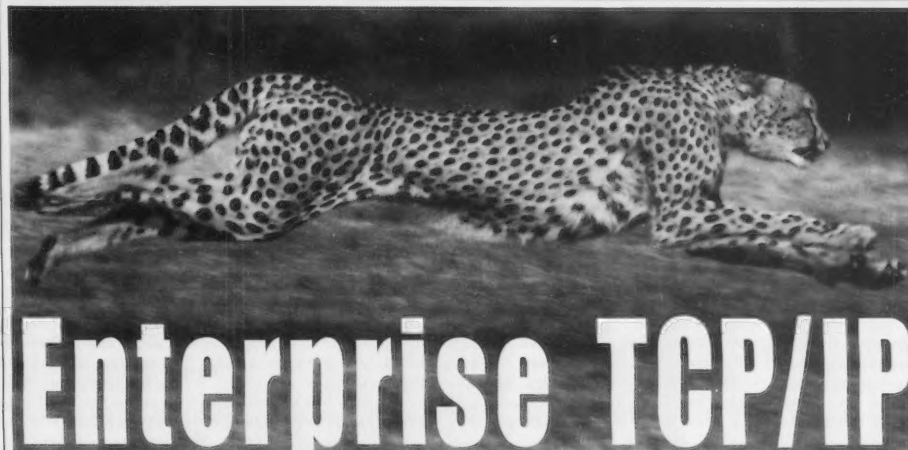
When the formal tariffs are approved by the FCC, AT&T Corp., MCI Communications Corp., Sprint Corp. and other frame-relay providers will have little price flexibility, said Tom Nolle, an analyst at the CIMI Corp. in Voorhees, N.J.

Analysts agreed that actual prices will remain about the same. Carriers will honor current contracts and will not want to rock the boat by offering new customers better deals.

The plus side of the FCC ruling is that "it's always nice to have a level field where you don't have to be a power negotiator to get frame relay," said Tim Burke, an analyst at The Yankee Group in Boston. The downside is an additional layer of government regulation, he said.

Nolle pointed out that unless the FCC requires the carriers to file detailed rate structures that are conducive to apples-to-apples comparisons, consumers won't benefit much.

And Mike Smith, an analyst at Datapac Information Services Group in Delran,



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Warehousing

CONTINUED FROM PAGE 1

By using an internal World Wide Web architecture rather than a traditional LAN, the company has avoided having to write client programs for each of its PC and Macintosh user groups. Instead, Web browsers from Netscape Communications Corp. provide a consistent, cross-platform interface for the 175 to 200 users who will access the warehouse by the end of next year.

An internal Web application runs over the Internet infrastructure but resides behind a company's own security layers, which protect it from random 'net surfers.

The goal of Cracker Barrel's project is to give users companywide access to daily, weekly and month-

ly sales data sent from 200 restaurants to the company's IBM AS/400 minicomputers and then copied to Microsoft Corp.'s Windows NT-based Web server.

The company plans to outfit an early wave of 20 to 30 power users with the sales analysis application in November.

"We knew that we wanted to get into warehousing to get a handle on sales trends and the like," said Joe Baltimore, a senior network engineer at Cracker Barrel. "And then we discovered this Web stuff."

In early August, 11 designers, developers and network engi-

neers were assigned to the project, which came in 45 days later and cost less than \$10,000, Baltimore said.

The addition of NT to the mix was critical, Baltimore said, because of a lack of Internet software for AS/400s. He chose Framingham, Mass.-based Process Software Corp.'s Purveyor Web server.

Yet pioneering as complex a Web application as data warehousing has its headaches, Baltimore said.

For example, four database designers and developers at Cracker Barrel had to manually write scripts to get the firm's AS/400 database to converse with the NT-based Web server.

But most ticklish, Baltimore said, was figuring out how to automatically update information residing at the Web server when corresponding data on the AS/400 was changed.

For that, programmers wrote complicated triggers with a combination of Microsoft's Visual Basic and the C language. An "overseer" table watches for changes and nudges triggers into action when data updates are required on the Web server.

Another problem that Baltimore said he hopes a maturing market will address is that true analysis capabilities are limited for users who grab data with a Web browser.

"Netscape lets us get a good view of the information, but if we



Cracker Barrel's Joe Baltimore: "We knew that we wanted to get into warehousing to get a handle on sales trends and the like. And then we discovered this Web stuff."

really want to play around with it and perform what-if scenarios, we have to then transfer the data to spreadsheets" or other tools, he said. Fortunately, for many of Baltimore's target us-

ers, simple access to the data "is good enough for now," he said.

Several major newspapers team up to offer help wanted ads on the Web. See page 54.

Users to Tandem: Slow down!

CONTINUED FROM PAGE 1

ing system every six months is "a little aggressive but not unheard of" in the computer industry, said Jim Johnson, chairman of the Standish Group International, Inc. in Dennis, Mass.

Johnson said Tandem's response to users' complaints — providing a menu of new fea-

tures and bug fixes — sounded unique.

According to Lawler, a technical consultant at CrestCo Ltd., a financial information systems firm that tracks London Stock Exchange trades, some Tandem users who ignore new operating system releases risk losing support services because Tandem provides prompt help-line assistance for only "the last two or

three releases." Users on older versions have to wait for help, he said.

In agreement

Other users echoed some of Lawler's concerns.

Giancarlo Scaini, systems manager at Societa Per I Servizi Bancari (Society for Banking Services) in Milan, Italy, said Tandem's release practices create a problem for his company, which administers consumers' debit-card transactions for

Italian banks.

"So many releases in such a short time — it's in conflict with continuous availability," Scaini said. "We would have to bring a system down to test [new software]. It's important that we have continuous availability."

Mark Pleticha, manager of Tandem systems support at Wells Fargo Bank in San Francisco, said Tandem users have seen a drop-off in support since 1993, when the company started emphasizing telephone assis-

tance instead of site visits by systems experts. Tandem previously had more staff who could visit user sites and deliver support, Pleticha said.

Wilson said the Tandem National Support Center is ready to provide quick assistance on the most recent versions of the NonStop Kernel operating system, such as the D series and most of the C series that preceded it. Wilson said the company will provide special support contracts for users on older versions of the operating system.

The new process, to be implemented in the coming months, will be up and running by next fall's ITUG conference, Wilson said. "It allows people to choose what fixes they need and the new features they need," he said.

"I think [Lawler] is describing the feelings that an understaffed operations outfit might feel. As Tandem brings out major functionality releases every six months, it is difficult to keep up with the change. But that will only accelerate as Tandem continues to move toward open systems" products, said Philip Landau-Smith, a database middleware developer at ITI, Inc. in Paoli, Pa.

Tandem bets the future on its ServerNet technology. See page 32.

Tandem's quarter off, Treybig steps down

Shrinking profit margins and disappointing fiscal 1995 profits prompted a top-level management shake-up at Tandem last week, including the replacement of founder James Treybig as president and chief executive officer.

Tandem said it earned \$19.8 million on \$640 million in sales for its fourth quarter compared with net income of \$71 million on \$604 million in sales for the same period a year ago. Earnings for fiscal 1995 were \$107.5 million, down from last year's profits of \$170 million.

That hurt

The company cited the delayed introduction of its Unix-based Integrity servers that hurt quarterly sales to telecommunications customers, a key Tandem market.

The company also realized lower-than-forecast revenue for its product line. And Tandem's networking products subsidiary, UB Networks, suffered declining sales, the company said.

Treybig announced he is ending his 20-year tenure as Tandem's president and will step down after the company names a replacement in the next several months. Once that happens, he will become chairman of the board at Tandem.

In addition, two other top longtime Tandem executives — Chief Operating Officer Robert C. Marshall, a 20-year veteran, and Donald E. Fowler, general manager of the solutions products group and a 10-year veteran — will retire in December, the company said. Thomas J. Perkins, the company's current chairman and an original venture capitalist investor in

Tandem, will remain on the board of directors.

James Johnson, chairman of The Standish Group International, said Tandem has struggled with the problems faced by a proprietary systems vendor trying to move to the open systems products demanded by the marketplace. But Tandem had been sluggish to move, he said.

David Lawler, president of the International Tandem Users Group, said the management changes caught users by surprise. But he added that the moves signify Tandem's commitment to move into a world of open systems.

"People see it as a healthy move. Tandem is well positioned in technology terms, and they see that the significant changes in the sort of senior executives announced will be good for Tandem," Lawler said. "People needed to see they're actually willing to change the culture of the company."

—Michael Goldberg

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Oracle Web package raises Internet ante

WebSystem could replace network software at user sites

By Dan Richman
BOSTON

Oracle Corp. is expected to raise the stakes here today in the Internet game

with the debut of a free World Wide Web browser and software that adapts its relational database management system to Internet use.

Analysts and users said the products

in Oracle's WebSystem suite, and similar products from competing vendors, are significant enough to herald a major change in client/server computing.

That change will be the shift toward using the Internet instead of conventional networking software, which may culmi-

nate in the replacement of PCs with inexpensive, simple Internet-access devices.

Oracle's PowerBrowser, formerly known as WebStation, will lead the way to more interactive Web sites, users and analysts agreed. Free of charge, it is scheduled for delivery by year's end and appears to exceed the capabilities of market-leading Web browsers from Netscape Communications Corp., NetManage, Inc. and other vendors.

"Oracle has done some very, very cool things here, making the browser able to be a local server and to create a home page on any machine," said Robert Martin, vice president of network programming services for HBO, Inc. in New York.

PowerBrowser has its own Hypertext Transport Protocol (HTTP) server — software that can host a Web site — allowing any PC or Macintosh to function as a server and a browser. It can develop applications graphically using the standard Hypertext Markup Language, and it adds Database Markup Language (DBML) for data validation. DBML is a Basic-based scripting language. PowerBrowser also will run applications written in Sun Microsystems, Inc.'s Java language.

WebServer Option, a second product in the WebSystem suite, allows Oracle's Oracle7 Enterprise Server RDBMS to be used as an HTTP server. WebServer Option is available immediately for Sun's SPARC Solaris. It is promised for Microsoft Corp.'s Windows NT and major Unix platforms by early November. The list price is \$4,995.

The third WebSystem product, WebServer, operates like WebServer Option but includes a copy of Oracle7 Workgroup Server. It is set to ship by the end of November for SPARC Solaris, SCO, Inc.'s Unix and Windows NT. The list price is also \$4,995.

Aron Dutta, a principal at Booz Allen & Hamilton, Inc., a consultancy in New York, said his firm would evaluate the Oracle products.

"If they give us more than Netscape's [products] in terms of interoperability with other vendors, scalability, ease of management, ease of integration and security, we'll think about buying them," he said.

Dutta said he was particularly impressed with the virtues of using the Internet as an intracompany network.

"It is a miracle" how easy it is to develop and distribute secure, reliable, reusable Internet applications, he said.



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The Newspaper of IS

New brew

Oracle plans to announce this week that it will integrate Sun's Java Web development language with Oracle's forthcoming Web servers. Oracle also plans to build Java support into its Unix relational database and several other products next year.



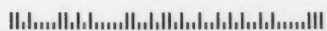
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News

NT server routing tool ships

By Bob Wallace

Eicon Technology, Inc. has become the first internetworking vendor to ship a product said to enable Microsoft Corp. Windows NT servers to support the wide-area network routing functions of stand-

alone branch office routers.

With built-in routing, users can cut LAN congestion by going directly to the servers, rather than over LANs, to access files. Built-in routing can save users hundreds of dollars per site by making stand-alone routers unnecessary.

Eicon's product, called WAN Services for Windows NT, comes just months after Compaq Computer Corp. teamed with Cisco Systems, Inc. in a similar effort, but those companies didn't announce a delivery date. Microsoft has also jumped on the bandwagon with plans to build rout-

ing features from Bay Networks, Inc. into its Cairo operating system that will ship in mid-1996.

The Eicon approach differs from Microsoft's project in that Microsoft is building routing directly into the operating system. "This gives you a much tighter coupling than using cards with their own software," said Skip MacAskill, a senior research analyst at Gartner Group, Inc. in Stamford, Conn.

Novell, Inc. became the first major server vendor to build routing into its servers in the early 1990s.

Users said they see benefits besides cost savings by integrating routing capabilities into NT servers.

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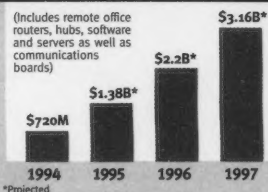
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Remote access market



Source: Infonetics Research, Inc., San Jose, Calif.

"This will lessen the load on our LANs by having users directly access applications on the server, which is a big benefit," said Alex Thurber, president of the Thurber Group in Portland, Ore.

Users need to determine if adding router duties onto the server will slow server performance.

"The performance of a combination server/router will be directly related to the architecture of the server," MacAskill said. "If you don't plan to push the server hard as a server, the combo approach can be extremely attractive."

MacAskill added that this approach is appealing if a user wants no-frills routing functionality, but it could present problems if a user adds more and more routing features to the server.

Thurber said he wasn't overly concerned about a potential drop in server performance.

"We'll be able to markedly lessen the congestion on our Ethernet LANs, which we think is worth any potential performance hit," Thurber said. "It's something we'll definitely have to look at once we install the cards."

WAN Services for Windows NT enables the server to support IP routing over frame-relay, leased and X.25 connections. A future release will support Novell's IPX protocol.

The software runs on Eicon cards that work with servers supporting Intel Corp.'s x86 and Pentium, Digital Equipment Corp.'s Alpha, Mips Technologies, Inc.'s chips and the PowerPC.

WAN Services for Windows NT software is priced at \$595, with Intel x86, Pentium and Digital Alpha versions shipping this month. The Mips and PowerPC versions will ship next month.

The software operates with Windows NT3.51 and runs on the EiconCard family of networking cards, priced from \$1,095 to \$1,495.



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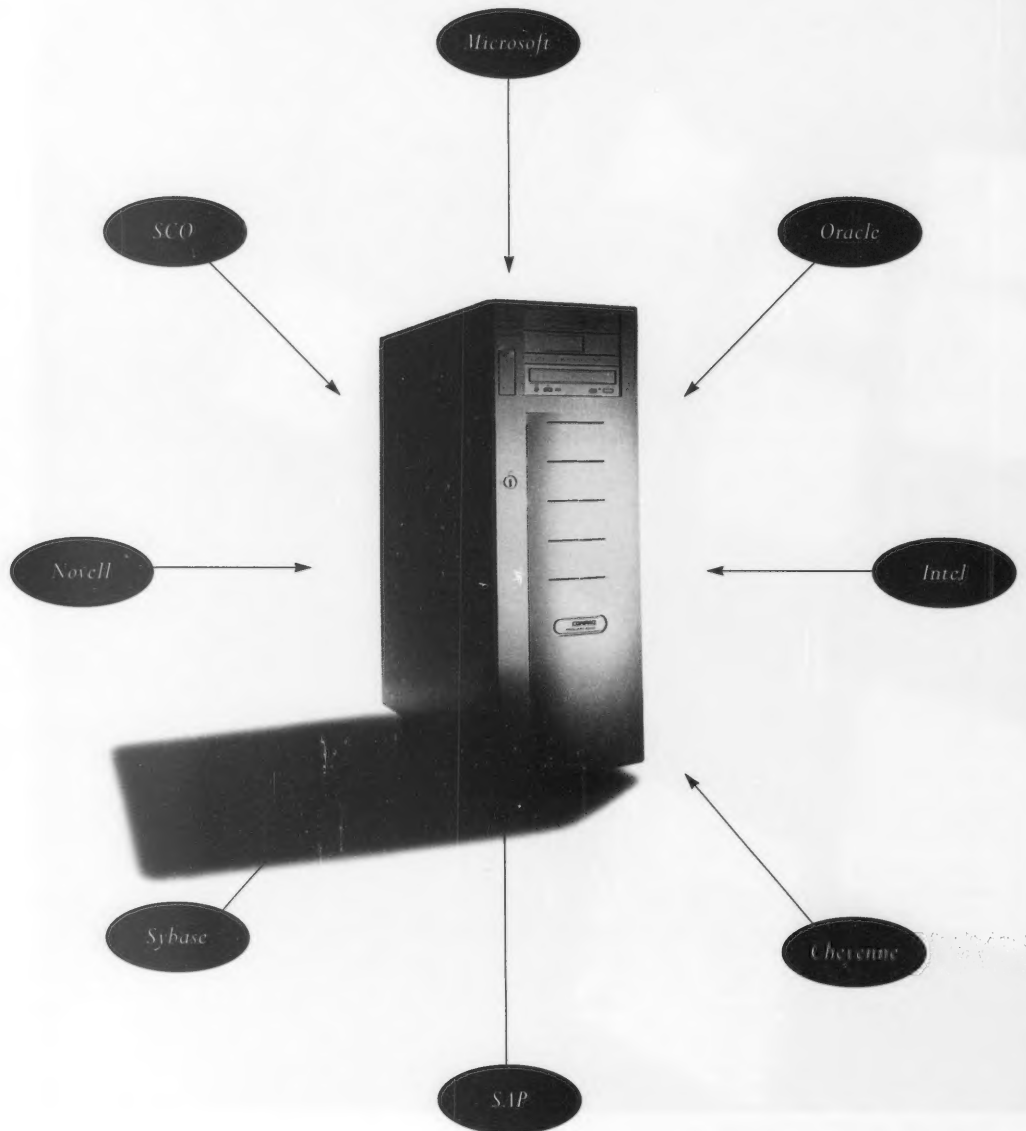
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You see, they may be Compaq servers. But they are Compaq-Microsoft-Oracle-SAP-Intel-Novell-SCO-Sybase-Cheyenne solutions. (We just couldn't fit all those logos on them.)

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Has It Changed Your Life Yet?

Business execs fault IS info gap

Survey says IS fails to provide accurate cost data, performance measurements

By Mitch Wagner

Computerization continues to fail to provide business executives with the information they need to make important management decisions.

That grim observation came last week from a Price Waterhouse survey conducted among about 200 executives from all areas of business, including marketing, financial functions and information technology.

"It comes down to communication: Are the IS people communicating with the business folks?" said Winthrop Cody, vice president of information systems at Copeland Associates, Inc., an investment company in East Brunswick, N.J.

He and other IS professionals at the annual Society for Information Management conference last week in Orlando, Fla., said the findings struck a familiar and disillusioning chord.

Several said the reason behind the lack of good business information is that IS managers haven't been able to find out

what kinds of information business executives really need.

"IS professionals are not marketing and financial professionals," Cody noted. "There have got to be people in those areas that can define their needs."

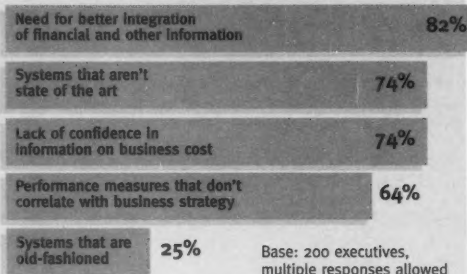
Only 13% of executives in all business functions said they had good information to anticipate the needs of their markets. The executives surveyed also cast doubt on the accuracy of cost data, integration of financial and other business data and the extent to which performance measurements are actually tied to business strategies (see chart).

The survey was conducted in conjunction with Lawson Software in Minneapolis. Lawson makes client/server business software.

Separation anxiety
Information technology often fails to provide good business information because IS departments are isolated from the rest of corporate culture, said Brian Coffman, director of the management center for CNL Group,

Information gap

Users gave IS failing grades for the following reasons:



Source: Price Waterhouse, New York; Lawson Software, Minneapolis

Inc., a real estate investment firm in Orlando. Coffman, an assistant to CNL Group's chief executive officer, is working as a facilitator between the IS department and other business units in his company.

"Most of the time there is a definite boundary between any business units but especially for IS people," Coffman said. "It's often difficult to communicate outside in a walled-off IS unit," Coffman said.

At CNL Group, the IS department gives some staffers office space in user departments so IS staffers can become immersed in that other department's culture and learn its needs. One staffer, an application developer, even has a desk on wheels so he can move from one department to another as needed.

James Krueger, director of corporate information services at Hydrite Chemical Co. in

Brookfield, Wis., said IS managers must get beyond tending to their systems and talk to business executives to define what the company's needs are.

Krueger said Hydrite is struggling to close the gap between user needs and what IS delivers. "We spend the greatest amount of time at work involving the user, finding out what they need, more than what we spend on technology," he said.

Ask for what you want

Management consultant Dudley Cooke, president of the Executive Insight Group, Inc. in Bryn Mawr, Pa., said the problem with information quality often arises because businesspeople don't ask for the information they need.

"It's easy to say you didn't get the information you want," he said. "But did you ask for it?"

Joseph Felieu, manager of the San Mateo, Calif., IS service center for the U.S. Postal Service, said he found the results of the Price Waterhouse survey disheartening. "It's certainly not a formula for a long career life if your internal client is saying that about you," he said. "That's disillusioning."

'HOT' multimedia software gives users competitive strategy tool

By Tim Ouellette

Don't look now, but your competition may be ready to Crush you.

Crush, a multimedia software offering from Hands on Technology, Inc. **Multimedia** (HOT), promises to

help companies develop marketing strategies based on market factors and internal data.

The package lets users segment markets, define trends, prepare competitive positioning maps and create marketing strategy reports. Users enter their own data into various templates and can also import data from databases, spreadsheets and on-line services to the templates.

Throughout the process, video clips and multimedia case studies can be viewed to provide background information and tips about how to get the most out of the software.

Rick Davis, HOT's marketing director, calls Crush a real-time insight tool because users can update their strategies instantly based on new information. They can still use the multimedia features to get background information and create better presentations.

More important, users can step into their competitors' shoes and look at their own strategy.

Crush is one of the first multimedia titles to target business users instead of consumers. To make updating the video clips and adding new data sets easier, the application part of Crush is loaded onto a user's PC, while the multimedia content remains on the CD-ROM.

The strategy of targeting business users may be a wise move if Burlingame, Calif.-based HOT's claims — that the \$499 package has \$1 million in product orders already — are true.

But don't believe the multimedia hype just yet.

"It is a good start, but it has a ways to go," said Scott Nelson, research director for marketing tools and analysis at Gartner Group, Inc. in Stamford, Conn. He said the user interface can be confusing, and the inclusion of a proprietary database format can limit some use of

the plan results. He ticked off a number of features that he said would make

the product more useful. These include providing customized data sets for different markets, which can be obtained by downloading from HOT's World Wide Web site (<http://www.hot.sf.ca.us>) or adding a planned metrics module.

"There are still no real shortcuts to going through and thinking hard about your marketing situation; it doesn't really come through with a silver bullet," said Stephen Barrager, an analyst and beta user at Strategic Decisions Group, a management consulting firm in Menlo Park, Calif.

But Barrager was positive about having a mix of video

clips and an actual working application. "It has a much different feel to it than a normal how-to package. For a start-up company it would be right on the money" because it provides the benefit of learning well-known marketing strategies without paying for a consultant, he said.

"If you are in an industry like high technology, just keeping up with the competitive environment is a monstrous job," Nelson said. Crush can benefit firms that don't have a good handle on their market planning process, including small high-tech start-ups, he added.

Crushed

The marketing philosophy and tutorial video clips in Crush come from HOT Chairman Regis McKenna, a marketing analyst who has high-tech experience with Intel Corp. and Apple Computer, Inc.



Crush's multimedia display makes it easy for users to highlight market trends in a number of categories that affect their businesses

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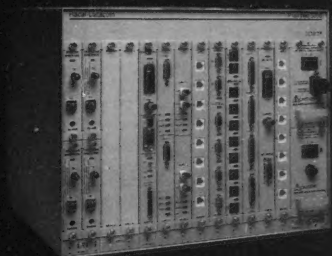


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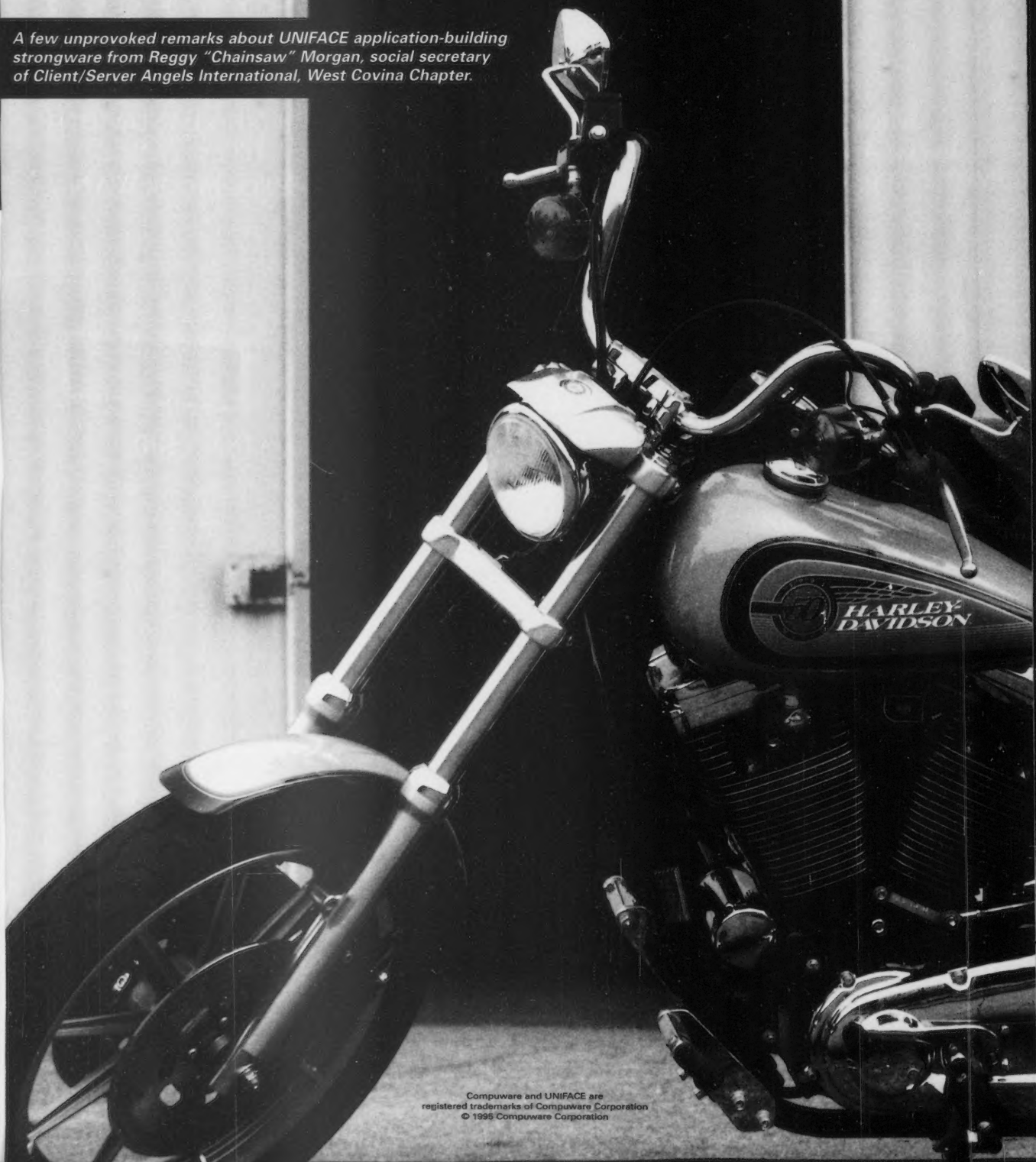
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A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.

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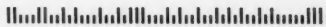
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Computer Industry

Briefs

DEC quarter up

Digital Equipment Corp. last week reported \$48 million in first-quarter profits on \$3.27 billion in sales for its fourth consecutive profitable quarter. The Maynard, Mass.-based firm lost \$131 million on \$3.12 billion in sales during the same quarter last year.

Netscape profits

Netscape Communications Corp. last week reported a \$1.4 million profit for its fiscal third quarter, logging its first quarterly profit in its 18-month history. The Mountain View, Calif.-based firm posted a loss of \$1.6 million for the same period last year.

Unisys posts loss

Unisys Corp. reported a \$32.2 million third-quarter loss last week. It earned \$30.8 million in last year's third quarter on revenue of \$1.48 billion. Revenue declined to \$1.46 billion in this year's third quarter.

AMD to bolster Intel defenses

NexGen gives clone maker needed ammo

By Jaikumar Vijayan

It seems like Intel Corp.'s aggressive dominance of the chip industry is driving at least one pair of rivals into each other's arms.

Advanced Micro Devices, Inc., the largest manufacturer of Intel chip clones, last week announced it will acquire tiny rival NexGen, Inc. in a move aimed at bolstering AMD's competitive position against Intel.

"[The acquisition] puts AMD back in the race," said Tony Massimini, an analyst at Semico Research Corp. in Phoenix. The result could be more low-cost alternatives to Pentium and Pentium Pro-class systems by late next year, observers said.

Cherished chip

The \$860 million acquisition will give AMD instant access to NexGen's recently announced Nx686, its sixth-generation processor technology. The Nx686 reportedly may rival Intel's next-generation Pentium Pro.

The move eliminates any need for AMD to continue with

its own straggling sixth-generation project that targets the Pentium Pro. The company is seriously behind in its plans to launch even a fifth-generation Pentium rival; the delay was expected to have a domino effect on the sixth-generation project.

AMD said it will drop the latter project immediately. Instead, it will bring to market NexGen's Nx686, now called K6.

Some in the industry also see the merger as a tacit admission of AMD's continued inability to clone Intel chips without using Intel copyrights.

AMD's K5 chip represents the company's first original clone design, but continued compatibility problems with standard x86 software have already pushed launch of the chip well past its mid-1995 schedule. NexGen announced its first Pentium clone late last year, while Cyrix Corp. unwrapped its version earlier this month.

Still, AMD plans to push ahead with its long-delayed Pentium clone, which it hopes to ship in volume by the third quarter of 1996. NexGen's clones ri-

Dueling dowries

The pending merger of the two chip makers will unite the following strengths:

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- Financial strength

NEXGEN

- Advanced chip technology
- Design and development talent

val Pentium performance, but they aren't pin-compatible with Intel's processors. This means NexGen customers must build separate motherboards to implement the chips in their systems. AMD's K5 chips, however, will fit into any standard Pentium socket. They are expected to be more attractive to systems vendors for that reason.

Under the planned buyout, NexGen will become a wholly owned subsidiary of AMD and continue to operate out of its Milpitas, Calif.-based headquarters. All future products

will be merged with AMD's brands. As a result of the merger, the Nx686 chip will be manufactured on a sophisticated 0.35-micron manufacturing process at AMD's new billion-dollar Fab 25 plant in Austin, Texas. "NexGen is a great fit for us. It gives us a very experienced design team; it gives us a very competitive sixth-generation product," said an AMD spokesman.

NexGen, which was the first vendor to announce Pentium clone products last year, also was the first to announce a Pentium Pro-class product this year. The company, however, has been severely hampered by the lack of its own manufacturing capability. It has had to rely on IBM Microelectronics to do its manufacturing.

Despite rounding up more than 100, mostly very small, customers worldwide, fewer than 100,000 of NexGen Pentium clones are estimated to have been sold so far. Intel is estimated to have sold more than 30 million Pentium chips.

Intel has leg up on rivals and will until the second half of next year. See page 41.

Industry starts to take heed of Tandem's ServerNet

By Michael Goldberg
SANTA CLARA, CALIF.

Since introducing ServerNet systems technology in July, Tandem Computers, Inc. has pledged to make it an industry standard by selling it to other systems makers. And while no one is crowning Tandem as the next rising giant, other industry players are starting to listen.

For example, last month, NEC Technologies, Inc. joined with Tandem to build a fault-tolerant server with ServerNet inside to run on Microsoft Corp.'s Windows NT operating system. The server is due in the middle of next year.

And two weeks ago, Compaq Computer Corp. said it would team with Tandem to produce low-latency clusters of Compaq servers using Peripheral Component Interconnect cards with ServerNet hardware and soft-

ware. Compaq hopes to unveil PC server clusters late next year or early in 1997.

ServerNet, which was designed to be an express train for data that doesn't require CPU processing, has piqued the curiosity of other potential buyers, claimed James Treybig, president and chief executive officer of Tandem.

In one of his last official interviews as CEO here last week, Treybig said the firm will announce another deal, similar to the Compaq one, "with another major company, very shortly."

For \$2 billion Tandem — tra-



Tandem's James Treybig says ServerNet will push the company into the retail realm.

ditionally an enterprise server maker for financial and telecommunications companies that need fail-safe systems — the Compaq deal means changing from a specialty shop to a mass-market retailer.

"ServerNet puts us in another space in the industry. The part we're in is a sliver of the market. But with ServerNet, we can be in the whole thing," Treybig said.

Tandem will become a commodity ingredient provider for servers and clusters of computers, reducing the technology's cost as its use widens, Treybig

said. He said he will announce soon the formation of a technology and components unit at Tandem to mass produce ServerNet hardware and software.

Treybig said the Cupertino, Calif.-based company also will introduce five new systems with common hardware: two running on its proprietary NonStop Kernel operating system, two on Unix and one on Windows NT.

Big improvement

IS managers and applications developers gathered at the International Tandem Users Group conference here last week said ServerNet will improve the processing efficiency of new Tandem systems.

Shao Wang, an analyst at Smith Barney Equity Research in New York, said ServerNet is a great product for Tandem.

"It's basically a primary source for revenue growth for

the company," he said. That firms such as NEC Corp. and Compaq have sought to use ServerNet "is an interesting testament to the architecture. Tandem is pursuing this not unlike the way microprocessor companies license [their chips]," Wang said.

George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., said that in the wake of Compaq's announcement, ServerNet must be taken seriously.

That is a deal that, with accompanying database management software, could provide a low-cost Windows NT alternative to traditional midrange Unix vendors such as Hewlett-Packard Co., Sun Microsystems, Inc., Sequent Computer Corp. and Digital Equipment Corp.

Windows NT is working to scale up. See page 45.

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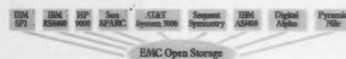
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Viewpoint

Blind worship?

Someone here in the office recently asked me why we didn't play the story of Jim Manzi's exit from IBM/Lotus on page 1 instead of page 6.

I said one had to read only the first few paragraphs of the story, where our reporter noted that big Lotus customers were quite indifferent about Manzi's leaving. Our own poll of big Notes customers showed conclusively that what users will or won't do with Notes' deployments will be affected little, if at all, by Manzi's departure.

Coincident with the news of Manzi's resignation, attention turned to Ray Ozzie, the chief Notes engineer who industry pundits and the press have linked to the success or failure of Notes. Will Ray leave IBM/Lotus once his commitment to bringing out the next rev of Notes is complete? Isn't Ozzie the guy that Bill Gates labeled as one of the five top something-or-others in the world?

Who cares? The media and the industry pundits, that's who. This industry, in its passion for hero-worship, has formed mantles of invincibility around certain individuals, mantles that don't match the real importance of these people to vendors and the products they produce.

Lotus for years has said its future has been staked unquestionably on Notes. Do you think for one minute that the board of directors of a billion-dollar company (bought this summer by IBM for \$3 billion) would bet its future on one individual, a person who could walk out the door and be killed by a drunk driver?

Idolatry has deep roots in this industry. Years ago, it was assumed that the departure of Gene Amdahl, the creator of the 370 architecture, would sound the death knell for IBM's large systems business. Sure it did. A few years later when Gordon Bell, the father of the PDP-11 and VAX computers, left Digital, the same dirge was played. That was just before Digital mounted the most impressive growth record in its corporate history.

I'm not trying to take anything away from the people mentioned here; each is extraordinarily gifted. But their importance to their companies has to be kept in perspective. At times the racket made by analysts and, regrettably, by the media makes that a difficult task.

Bill Laberis

Bill Laberis, Editor in Chief
Internet: bill_laberis@cw.com



"SARAH HAS BEEN HAVING SOME DIFFICULTY LEARNING TO TIE HER SHOES. ON THE PLUS SIDE, SHE DID SET UP OUR WEB SITE."

Manning Web isn't as easy as it looks

I don't completely agree with your "Web wise" article [CW, Oct. 2]. Hypertext Markup Language (HTML) generators will no doubt be added to every word processing program, but there will always be a place for programmers who can design a Web page.

Web pages can be interactive, for example, allowing a user to enter information to generate a query and return a document with useful information. This type of interactivity will take someone with programming knowledge on many fronts, and an understanding of how to design a Web page that handles forms would be essential.

Things like virtual reality markup language and Sun Microsystems, Inc.'s Hot Java will make designing a Web page a little more complicated than just firing up your word processor and dropping in a few bitmaps to get a decent HTML file.

Ryan Jentzsch
Acordia Personal
Insurance Services
Salt Lake City
ryan_jentzsch@atci.com

Will Microsoft learn from its errs?

"What? Microsoft weak?" [CW, Oct. 2] was a fascinating piece.

Not highlighted in your article, and perhaps not in the book, either, is how Microsoft will cope with failure. Learning is about failing. If you go from success to suc-

cess for years and years, you build up enormous potential for failure.

To use a boxing analogy, how strong a chin does Microsoft have? If the computer industry holds any lesson for us, it is that knockout blows always happen eventually, and occasionally they are self-inflicted.

Digital's knockout blow was denial about Unix. IBM's hubris was pretty much across the whole spectrum. But these blows aren't always terminal. Digital and IBM got up off the canvas to fight again, weaker but perhaps wiser, and each of them with new managers.

Microsoft, at 20 years old, is no longer a spring chicken. I, for one, would pay good money for a ring-side seat at the fight of the century between Microsoft and the No. 1 contender, whoever that might be.

Eric Leach
ELM Ltd.
Middlesex, England
100010.3012@compuserve.com

OS/2 overlooked

I was very surprised there was no reference to OS/2 in your article "Intel's P6 chip falls short of expectations" [CW, Sept. 25].

The article says Pentium Pro runs 16-bit applications slowly and Windows 95 users probably wouldn't benefit from it because of the 16-bit code in Windows 95 and limited availability of 32-bit applications. OS/2 is a mature, 32-bit operating system with an abundance of 32-bit software. I expected to see reference to its ability to handle 16-bit Windows applications with this Pentium Pro "problem."

James Vett
Bartlesville, Okla.

OLE omitted

I was surprised that Next's Distributed OLE product wasn't discussed in your article "Object standoff" [CW, Oct. 2] concerning the lack of interoperability among Object Linking and Embedding (OLE) and Common Object Request Broker Architecture (CORBA) objects.

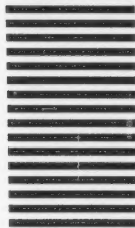
Distributed OLE supports Microsoft's OLE, providing developers with bidirectional distributed communication between Next's OpenStep object model on Windows and Unix and OLE objects. With full CORBA 2.0 support scheduled for next year, Next's Universal ORB will support full interoperation between OpenStep, OLE and CORBA objects, using languages such as Visual Basic, C and C++. This is an important marriage of the major distributed object models and deserved some investigation.

David L. Neumann
2136 South Blvd.
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 12. Vice President, Asst. VP
 13. Treasurer, Controller, Financial Officer

- DEPARTMENTAL MANAGEMENT**
 51. Sales & Mktg. Management
 70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
 80. Information Centers/Libraries, Educators, Journalists, Students
 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
 (a) Solaris (e) Mac OS
 (b) Netware (f) Windows NT
 (c) OS/2 (g) Windows
 (d) Unix (h) NextStep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

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 (d) Unix (h) NextStep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

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Verbatim

FROM A REPORT BY ANALYST STAN DOLBERG AT FORRESTER RESEARCH, INC. URGING INFORMATION SYSTEMS DEPARTMENTS TO FOCUS ON CUSTOMER-ORIENTED SYSTEMS:

Many large corporations have an internal focus that puts them in danger of losing market position. By failing to directly connect customers to back-office systems... these companies cede competitive advantage. [Information technology] must support marketing's need to quickly snap together new customer applications at "market speed."

Reinventing the back office for connecting to customers should be on the top of every chief information officer's priority list through the next decade. Smart companies will recast all [information technology] investments... based on revenue generation instead of traditional cost containment.

FROM A STATEMENT BY RYAL R. POPPA, CHAIRMAN AND CHIEF EXECUTIVE OFFICER OF STORAGE TECHNOLOGY CORP., ON HIGH-TECH ANTI-TRUST POLICY:

As competitors develop the better mousetrap, they must have the facility to attach that mousetrap to the other components of the system....

[For example,] access to operating system information was essential for VisiCalc in the development of its first spreadsheet, and access remains vital to all companies that do not own an operating system so that they can provide the advantages of their computer application programs to the consumer.

While this voluntary publication is often effective in promoting competition, it is also, obviously, subject to significant abuse. Operating systems can be changed rapidly, obsoleting the functionality of application programs. These changes can be either inadvertent or intentional. They might be made in order to [give advantage to] an application program that was developed by the owner of the operating system.

Dateline 1999: IS pros retire in droves

.....
Michael Cohn

Alarmed about the year 2000? Worried about YY date fields showing up as 00? Afraid to ask the chief financial officer for somewhere between \$2 million and \$20 million to fix the two-digit year problem?

We in the IS field know the truth. The danger that date-critical calculations will go haywire is real, it's cataclysmic, and we're toast. Everything from legacy to LAN may be flat on its back. But you can't expect most folks to appreciate the impact of something that is more than four years away. Heck, my dry cleaner has trouble looking beyond next Tuesday.

So don't lose sleep or hair over the 2000 problem; there are a bunch of ways out of this mess. Show no remorse, have no regrets and choose your strategy from the list below.

1. Retire. Get out of the business and make it someone else's problem. This may be the most common solution: IS executives will bail out in droves. Come the third quarter of 1999, the world will be devoid of IS managers — and just in time for us to finally get something done.

2. Relocate. Another popular option is to assign the problem to someone else. Bury it within the ranks. Suck in some subordinate. Or, better yet, impose it on an innocent contract



The solution to the 2000 problem? Retire, relocate, repair, relocate or just relax.

programmer. "Hey, Stan, want to make \$24 an hour? Our 30 million lines of date-infected code should keep you busy for a while — especially since we can't even find half of it."

3. Resign. Face it, when the folks upstairs find out how bad the problem is, you'll get the ax anyway. So have a little pride. Hold your head high, walk up to the CEO and unflinchingly insist you're leaving, even though the date thing is not your fault and you've put in the best 19 years of your life as the director of IS. To which he or she will likely reflect, take a deep breath, look down on you and say, "Tell me... who are you again?"

4. Re-engineer. Get rid of all your old software. Install a bunch of new stuff. How tough could that be, converting about 17,000 assembler programs? Let's see, at three a week, not counting Christmas, you could probably do it

in... well... see option 3.

5. Repair. OK, be brave and make the fix. But why stop at YYYY? Go five-digit! That'll hold for another 98,000 years. It may seem extreme, but I'm fairly sure our office furniture has been around that long, not to mention Mrs. McGillicuddy in Accounting.

6. Recycle. If we have to do a bunch of date conversions anyway, I say let's start all over. Set the calendar to begin at Bill

Gates' date of birth and make that 0 A.G. (After Gates). Of course, that might screw up the name Windows 95... Somebody better call the guy quick before they print up any more boxes.

7. Relocate. Move that data center to Honolulu. It buys you a couple of extra hours — and I bet you'll need them.

8. Relax. I figure we're doomed anyway. I'd guess that at one minute past midnight, New Year's Eve 1999, a bunch of enemy nations will try to bomb the heck out of us. We'll retaliate and hurriedly punch in our launch codes. The world will be watching as the system fires up and says, "Missiles activated. Time to launch: T-minus 100 years and counting."

Cohn works at a large computer company in Atlanta that will either expand its two-digit year fields or contract his five-digit salary.

We haven't gone to HAL yet

.....
Max D. Hopper

Stanley Kubrick's 1968 epic movie 2001: A Space Odyssey was special because it rigorously attempted to extrapolate the technology of its day and depict the advances we might credibly expect by a specific date in the future. It was a future so richly and realistically rendered that we could almost taste it.

Yet, now that the 2001 of real life is little more than five years out, we can see that our actual progress in space and computer technologies is nowhere near on schedule to fulfill that film's vision. Clearly, there will be no grand orbiting space station or thriving lunar colony by then. Bureaucracy and budget cuts have stymied our once-virile space agency.

And, despite an unprecedented explosion of innovation in information technology, our most advanced systems are still a long way from the movie's most colorful character, the HAL 9000 computer. HAL's ability to perceive and learn from its environment, converse naturally with humans, autonomously pursue its own (ominous) agenda and even demonstrate self-awareness meets the most demanding criteria for artificial intelligence. How far off this ambitious mark are we?

If we agree that the key objective of computers is to augment human understanding, and we rank machine intelligence in a hierarchy that runs from data through information and



Dave: "Open the pod doors, HAL."
HAL: "I'm sorry, Dave; I'm afraid I can't do that."

knowledge to wisdom, then we have a basis for quantifying our progress.

While there's still some work to be done in the data layer, we have moved well beyond data tabulation and for the most part our corporate systems now live up to the term "information systems." They are used to integrate and interpret the relevant data for us, providing more pertinent and useful responses.

For knowledge, an even more sophisticated level of understanding, we need to integrate a fund of information in order to see patterns and trends that enable us to make the jump to insight and prediction.

Essentially, this is the function of expert and decision-support systems. Although performance has lagged promises, today many companies use these systems to make decisions about credit approvals, resource allocation and revenue optimization. Although these systems are far from perfect, there is no doubt that

we've established an encouraging foothold on the knowledge tier.

The lofty pinnacle of understanding that we characterize as wisdom involves such philosophical attributes as the humble awareness that the models we've constructed will not always hold true. Wisdom requires the intuitive ability, born of experience, to look beyond the apparent situation to recognize exceptional factors and anticipate unusual outcomes.

These elusive characteristics are rare in humans and totally nonexistent in our machines.

Before AI researchers can hope to develop applications that emulate this level of understanding, they will have to achieve a far more profound understanding of human thought processes. Beyond that, we'll need computers with more processing power — by many orders of magnitude — to approximate the capabilities of the human brain.

Today, we're about as far from achieving either of these objectives as space travel to the moon is from interstellar voyages. Each is a challenge of mind-numbing scale; yet, given the plodding progress of rocket science, my money's on information technology's getting there first.

Hopper, former chairman of AMR Corp.'s The Sabre Group, is principal at Max D. Hopper Associates, Inc., a consultancy in Dallas.

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Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

Get a grip on storage management

By Steve Moore

Managing data on multiple desktop PCs can be like trying to get dressed when your wardrobe is scattered across several rooms in overflowing drawers and closets.

Many client/server users are confronted with an out-of-control storage management mess, with overloaded servers supporting growing populations of desktop PCs that often are stuffed with a gigabyte or more of mixed corporate and personal information.

Desktop storage management — which spans backup, archiving and hierarchical storage management functions — “is one of those issues where you just throw up your hands because it’s too large and too uncontrollable,” said Ki Wilson, a senior micro-computer analyst at Stone Container Corp. in Chicago.

Many possible solutions

Corporate America is dealing with this problem, or in some cases isn’t dealing with it, in various ways.

Most organizations end up with a policy like Stone Container’s in which they “encourage users to put important data on the server or back it up on their local drive,” Wilson said. But leaving end users in charge of critical data doesn’t guarantee that the data will actually be backed up.

At Brewers Retail, Inc. in Mississauga,

Ontario, the company has “given each user what is essentially a private, [server-based] virtual network drive and [has] encouraged them to store all their sensitive information or large volumes of information on those drives,” said Pompei Malik, the company’s information systems director. As a result, “nothing really valuable is sitting on anyone’s desktop,” he said.

Still, short of mandating diskless workstations — a situation that would force users to store data on common networked drives — most organizations can’t ensure that critical corporate data never resides on end-user desktops. And despite the risk that situation presents, few companies have the staff or budget to develop and implement effective PC storage management policies.

“We do not manage [storage] down to the desktop; we’re having a heck of a time managing it at the network level,” said Larry Lemay, a network engineer at Computer Language Research, a Dallas-based corporate tax processor.

With 1G- to 2G-byte disk drives becoming common on workstations and those drives typically holding 20M to 300M bytes of “real corporate data,” protecting that data has become a major issue for the firm, he said.

Lemay and other users described the following four alternative desktop storage management strategies:

Storage management, page 41



Intelligent agents at work

Since no existing software is up to the job, Publishers Printing Co. is having a third party develop a custom application that will track individual files, using software agents running in the background.

Proactive data management is literally “a huge issue” for Publishers, which “can’t have [printing] presses waiting for anything,” said Hank Hensel, network manager at the big specialty printing firm. The company has about a terabyte of storage space to manage across 25 server and super-server domains, he said.

If employees can’t get the information they need and deliver it to the printing press at exactly the right time, the Sheperdsville, Ky.-based printer faces expensive downtime.

The custom application, which will run on Unix and PC platforms, will also manage storage space on servers. This way, the software will “marry hierarchical storage management to a workflow process,” Hensel said.

“I need to conserve disk space, but data has to be already on the drive when I need it, and I deal with 300M- to 400M-byte files. The only way to do that is with a very sophisticated data management tool,” he said.

The company also is seeking to eliminate situations in which a server failure causes one user to pull data to a PC to work on it, and users on the next shift can’t find that data.

“We will track where the data was saved to, who was working on it, how long they had it and how it was changed,” Hensel said. Today,

data is tracked by a barcode system that depends on “wandering” of bar codes on employee badges and removable disks. Data ultimately will be tracked and moved electronically.

— Steve Moore



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Flood of next-generation chips predicted

Intel, Cyrix, AMD to release high-speed processors next year

By Jaikumar Vijayan

By the middle of next year, users will have a flood of microprocessors to choose from when a variety of next-generation chips hit the market.

These chips will be faster, smaller, consume less power and be packed with multimedia capabilities. They will be aimed at the portables, commercial desktop and consumer segments, industry analysts said.

"1996 is going to be the year of the Pentium-class processor. Prices have gone down, the market is evolving... [and] Pentium is going to be the generational processor that almost everybody will be using," said Mike Griffith, an analyst at In-Stat Research, Inc. in Scottsdale, Ariz.

This means users can expect relatively less-expensive alternatives to Pentium-based systems, particularly in the con-

sumer market.

Leading the pack will be Intel Corp., which is expected to keep revving clock speeds on its desktop Pentium processors throughout next year as it tries to push the chip deeper into the portables market.

The company's recent announcement of its Mobile Triton Peripheral Component Interconnect (PCI) chip sets, for instance, will set the stage for as many as five new notebook Pentium chip sets over the next year, according to a recent report in "Microprocessor Report," an industry newsletter in Sebastopol, Calif. Thus far, the Pentium chip has been slow to penetrate the mobile market.

Intel's upcoming mobile chips will range in speed from the recently announced 120-MHz chip to a 167-MHz chip and will incorporate better power management and 0.35 micron technology. Moving to 0.35 micron will

help Intel keep the chip's power dissipation to about the same level as today's mobile Pentiums but at much higher clock speeds, the report said.

Pushing Pentium performance further on the desktop and portables will be Intel's so-called P55C technology. This is an enhanced Pentium design with larger on-chip caches, lower supply voltage and new multimedia extensions.

In the forecast

Also due to ship in volume next year is the sixth-generation Pentium Pro, slated for launch Nov. 1. The chip will be initially positioned in the high-end Microsoft Corp. Windows NT-based workstation and symmetrical multiprocessing markets.

Intel declined comment on future products.

Meanwhile, rival chip maker Cyrix Corp. in Richardson, Texas, will produce a version of a

The next generation			
COMPANY/CHIP	INITIAL SPEED	CACHE	PLATFORMS/AVAILABILITY
Intel/Pentium Pro	150 MHz	16K bytes	Workstations, SMP servers and PCs/November
Cyrix/6x86	100 MHz	16K bytes	High-end PCs/Now
AMD/NexGen/K6*	180 MHz	48K bytes	High-end PCs/Second half of 1996

*After AMD's acquisition of NexGen, NexGen's Nx686 will become the K6

fifth-generation multimedia chip. Aimed mainly at the consumer market, the chip will have an initial clock speed of 120 MHz, a PCI bus interface, an integrated graphics accelerator, a 16K-byte cache and new multimedia extensions.

"The window of opportunity [in the Pentium market] is moving fast, and all these vendors are trying to get products that will fit in the Pentium class before it starts hitting its peak, too," said Tony Massimini, an analyst at Semico Research Corp. in Scottsdale, Ariz.

Other chips scheduled to ship next year include the following: •Cyrix's recently announced

MI chip, now called the 6x86 processor. The chip initially will have a speed of 100 MHz and be positioned for high-end desktop PC and mobile markets.

•The 180-MHz Nx686 from NexGen, Inc. The sixth-generation chip has been renamed the K6 following the acquisition of NexGen by Advanced Micro Devices, Inc. last week (see story page 32) and will be aimed at high-end commercial desktop users.

•AMD's long-delayed K5 Pentium clone, a 133-MHz 486DX4 chip mainly for the mobile market, and a watered-down 75-MHz version of its K5 technology for the entry-level desktop.

Storage management

CONTINUED FROM PAGE 39

- Equipping each workstation with its own backup hardware and software that users must remember to invoke.
- Installing shared departmental storage servers on which all or select data on LAN-attached PCs is backed up regularly by users or a local administrator.
- Making users responsible for loading their data at regular intervals onto large domain servers that central administrators back up to a central site over the corporate LAN or WAN.
- Purchasing or developing complex software for automated, remote backup of all workstations via the corporate LAN or WAN.

Unfortunately, each strategy has significant drawbacks, users said.

The first approach becomes more costly with each added PC supported, and users still may fail to do backups. The second calls for secure management of growing collections of backup tapes for each department, and the third and fourth solutions can bog down networks.

With 300M to 500M bytes of data to back up on each of the 1,500 workstations at Computer



Desktop storage management "is one of those issues where you just throw up your hands because it's too large and too uncontrollable."

Ki Wilson,
Stone Container Corp.
Chicago



"Nothing really valuable is sitting on anyone's desktop" without being backed up.

Pompei Malik,
Brewers Retail, Inc.
Mississauga, Ontario



"We are far less certain about managing data storage utilization on the desktop itself."

Nancy Wong,
Pacific Gas & Electric Co.
San Francisco

Language Research, "we're talking terabytes of data. And you just can't go across the wire with that type of data on a constant basis" when the corporate network consists of 4M and 16M bit/sec. Token Rings, Lemay said. The firm currently requires users to load their own data onto large network servers and is searching for a more effective, permanent solution, he

added.

The rapid rise of client/server computing has made PC storage management difficult even for large organizations with comprehensive technology management strategies. "Seventy percent of the [desktop data management] solution is in end users' hands," and today's sophisticated, independent-minded PC users "have to be ap-

proached in the right manner and shown the pros and cons" of new corporate data management practices, said Paul Jones, general manager of information services at Unocal Corp. in Anaheim, Calif.

But currently, "there is not a best practice for backing up to the desktop" largely because doing so "is all wrapped into security, virus protection, indus-

trial espionage and social engineering" issues, he said.

Backup isn't the only problem with PC-resident data. IS staffers also want to make sure that PC disks are sized properly so that they aren't overflowing or too empty. But cheap disks have made that a low priority for now.

After working with a benchmarking firm to determine best practices for storage management, Pacific Gas & Electric Co. in San Francisco concluded that "while there are some cost savings to be achieved by managing data storage utilization on file servers, we are far less certain about managing data storage utilization on the desktop itself," said Nancy Wong, manager of the utility's computer and network operations.

A key problem cited by users is the lack of "space management software" that can track new files as well as additions to existing files on servers and PCs. Computer Language Research must manage "literally millions" of files and would "run out of space just keeping a history on that," Lemay said.

In the mainframe world, Lemay added, "there were tools that could readily tell you" where the storage consumption culprits were. Despite a year-long search, he said he isn't "aware of any software out there in the LAN world that will help."

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NT aims for high end

By Jean S. Bozman

Like Chicago's fog in the Carl Sandburg poem, Microsoft Corp.'s Windows NT is creeping into the high-end enterprise server market on little cat feet.

Sales of Microsoft's Windows NT Server are booming for departmental servers; about 400,000 copies are expected to be sold this year. But users said they want NT to support larger hardware systems. The lack of such support means big data warehouse and mission-critical transaction systems will continue to run on other kinds of symmetrical multiprocessing (SMP) servers that are equipped with eight or more processors, users said.

Glitches remain

Chief information officers and information systems managers said they are excited about the idea of replacing expensive mainframes and high-end Unix servers with less costly NT servers. But technical concerns linger about scaling up databases (see story below).

Still, many customers have paid \$20,000 to

\$40,000 to install NT servers for departmental applications and databases and already are testing them for bigger jobs. They view NT servers as a low-cost alternative to large Unix servers that can cost \$100,000 or more.

"I'd like to make the high end go away," said David Starr, CIO of ITT Corp. in New York. "Just do distributed computing with a bunch of servers." Even now, he said, the \$7 billion firm has some data centers that are "big, empty rooms with a bunch of servers against the wall."

But ITT has large Unix servers, including IBM RS/6000s and Hewlett-Packard Co. HP 9000s, to handle high-end data warehouse applications, Starr said.

"We're using Unix because we haven't done this NT conversion. I would expect it to be a couple of years before we have everything converted," he said. Starr said he sees years of coexistence among Unix and NT servers on the network.

Union Pacific Railroad already is running a pilot program to determine which of its applications can be moved to NT platforms in the future. The railroad has six mainframes, 60 Unix servers and more than 150 Novell, Inc. NetWare servers in sites across several states.

"The question is, 'How much can NT push upward and take over some of the midrange and enterprise processing?'" said Mark Davis, director of data management at the railroad's Omaha offices.

Even Microsoft executives admit large NT systems won't arrive overnight. "The next release of NT absolutely will have better scaling," said Jim



ITT's David Starr says the company isn't rushing to convert to NT

NT servers, page 48

ABA proposes controls on electronic signatures

By Gary H. Anthes

A legal framework for using digital signatures has just been published by an American Bar Association (ABA) committee. Its authors say the framework will act as a catalyst for adopting the technology and lead to more secure electronic commerce.

They also said the draft guidelines, which are open for public comment until Nov. 30, should serve as a foundation for the development of electronic commerce legislation. That may help head off a legislative Tower of Babel that the states are now creating, some observers said.

Digital signatures use cryptographic key pairs — one private and one public — to create tamper-proof messages. They aren't used to encrypt message contents for confidentiality but to ensure message integrity by providing a way to prove a message or file hasn't been altered in transit.

Digital signatures also ensure "nonrepudiation," protecting a recipient against a sender who falsely claims that he never sent a message.

The committee's 100-page document is essentially a long list of legal and technical definitions with amplifying explanation of the definitions. For example, it defines the required

properties of a "secure key pair" and offers references to other works on the topic.

The guidelines are intended to "establish a safe harbor, a clearly secure, computer-based equivalent" to pen-and-ink signatures, the draft said. The digital signature equivalent should minimize electronic forgeries, enable authentication of computer documents, facilitate electronic commerce and add legal support to technical standards for message authentication, the committee said.

"The guidelines are intended to stimulate a lot of thought as to what digital signatures are, how they are to be used, what the legal consequences are and



how one might want to design a certificate system," said Kenneth C. Bass, an attorney in the Washington office of Venable, Baetjer, Howard & Civiletti and a member of the committee drafting the report.

The ABA paper devotes a lot of attention to the legal duties and liabilities of trusted "certification authorities," which maintain directories of public keys.

Signatures, page 48

Scaling up is hard to do

Scaling up a system to run on more processors is a challenge for any operating system vendor, whether it is IBM, Hewlett-Packard, Sun Microsystems, Inc. or Microsoft.

For example, IBM added Unix SMP servers just last year and extended them to eight CPUs this summer. Windows NT, launched in July 1993, runs comfortably on four CPUs and even up to eight CPUs, Microsoft officials said. But 16 CPUs is still a reach, they said.

In comparison, some Unix systems have been scaled up to 32 or even 64 CPUs, analysts said.

Industry observers said Microsoft must work with hardware vendors to overcome potential bottlenecks in SMP servers. Key areas for scrutiny include cache memory, main memory and the speed of disk I/O. If any of those parameters isn't right, processors could become flooded with data, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Mike Nash, Microsoft's group product manager for Windows NT Server, said it isn't fair to compare how NT and Unix handle their CPUs. The important thing, he said, is that NT can handle many CPUs. "The NT server, the applications and the scheduler don't worry about how many CPUs are in the system," he said. "That's transparent to them."

—Jean S. Bozman

Briefs

64-bit SPARC-ettes debut

Fujitsu Ltd.'s HAL Computer Systems, Inc. subsidiary in Campbell, Calif., recently announced a 64-bit Unix workstation based on the unit's SPARC64 RISC chip. The high-performance unit includes SPARC64/OS 2.4, a 64-bit operating system that is based on Sun Microsystems, Inc.'s Solaris 2.4 Unix system. Art Goldberg, marketing vice president at HAL, said the computer is the first 64-bit SPARC-compatible workstation on the market. It costs \$33,000.

Entry-level RAID

Storage Dimensions Co. in Milpitas, Calif., has introduced SuperFlex 1000, an entry-level RAID storage system that initially will support Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT and IBM's OS/2 operating systems. A basic SuperFlex 1000 system with three 2G-byte drives and a RAID card costs \$7,035.

Performance problems?

Landmark Systems Corp. in Vienna, Va., has announced PerformanceWorks, a suite of client/server performance management software that lets administrators troubleshoot slow response times,

analyze performance trends and do capacity planning. The software can gather performance data about an application's use of a Unix or PC system's CPU, memory and other resources. Starter kits are available now and cost \$7,500.

SGI adopts new licensing

Silicon Graphics, Inc. has adopted Globetrotter Software, Inc.'s Flexdm software license manager for use with its systems. Flexdm replaces Gradient Technologies, Inc.'s NetLS software as SGI's licensing system. SGI also will use Flexadmin, a software asset management utility developed by Globetrotter.

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Workgroup Computing

Document-filing products keep HP current

SureStore server, jukebox among latest releases

By Stewart Deck

Hewlett-Packard Co. recently marched out a full load of storage products, including disk drives, a digital/audio tape drive and new tape storage systems. Leading this parade of products is a line of document-filing storage products, including an optical jukebox.

Hewlett-Packard is the No. 1 U.S. provider of optical storage products, according to a recent study by International Data Corp. In an effort to maintain its top position, the Palo Alto, Calif.-based company unveiled SureStore Archive Server and SureStore 165G-byte Optical Jukebox (see chart). Both products target the quickly growing market for document-filing systems.

"Hewlett-Packard has been one of the dominant players

[in this market] for the past three years," said John Freeman, president of Strategic Marketing Decisions, a market analysis firm in Los Gatos, Calif.

"They need to maintain that advantage by staying current in the market," he said.

Freeman said the document-filing systems market has grown 67% in the past year and is expected to more than triple by 1998.

Stiff competition

In order to fend off competition from companies such as Plasmam Data Systems, Inc. in Milpitas, Calif., HP must continue to rapidly bring products to market, Freeman said.

The SureStore Archive Server is already in place at Blue Cross/Blue Shield of Mississippi. Wade Matthews, PC ad-

ministrators at Blue Cross, said the company uses the box for "near on-line storage of forms."

Prior to installing the Archive Server, company employees who needed copies of a specific

form had to call someone in the graphics department. That person frequently had to burrow through stacks of paper to find the form, Matthews said.

If they couldn't find it, "they'd have to get out the graphics plates, print a bunch of forms

and then put most of them on a shelf somewhere," he recalled.

With the Archive Server, the forms are stored as images that can be retrieved and printed, Matthews said.

Big help

The Archive Server also has helped Gene Lester, president of North Texas Computer Service, Inc., streamline his business processes.

The server "knows where everything is," Lester said. His company keeps images of configuration files on the Archive Server.

Lester said the server has forced the company to decide what will be stored on-line and what will be kept off-line.

But making those decisions is far more enjoyable than having to "go back again into the computer room and manually change the external optical disc," he said.

Product parade

Hewlett-Packard recently unveiled a broad range of products, including the following:

Product	Type	Price
HP SureStore Optical Jukebox	165G-byte optical jukebox	\$40,000
HP SureStore Archive Server	Archive server for Novell's NetWare networks	Starts at \$8,950
HP C3635A	8.7G-byte hard disk	Starts at \$1,500
HP C4537A	24G-byte digital/audio tape drive	\$1,150
HP Colorado T4000s	8G-byte tape storage system	\$399

Arcland's FlowModel tool helps firms chart workflow

By Tim Ouellette

Companies looking to map their business processes now can test these processes at the same time with a new low-cost software bundle from Arcland, Inc.

The FlowModel 2.0 + BenchMarker 3.0 Solutions Pack from the Malvern, Pa., firm lets users model processes and link related data directly to objects in the chart. Users can then analyze the efficiency of each process.

With FlowModel's data exporting features and the addition of a strong benchmarking capability, analysts and users lauded the strength and flexibility of the product.

Albany International, a paper product manufacturer in Albany, N.Y., uses the \$695 Solutions Pack to document existing workflows and manufacturing process flows in relation to the firm's recent ISO certifications, said Michael Moriarty, supervisor of pressing research and development.

FlowModel 2.0 was designed to look and work like Microsoft Corp.'s Office suite and runs under Microsoft's Windows 95. It lets users link data to flow-chart objects.

The software also provides a complete view of the process, ranging from events to relationships to associated data and applications.

BenchMarker 3.0 was developed by Fleet & Partners, Inc. in Richmond, Va. It reviews flow diagrams from FlowModel and identifies defects, trends and efficiencies based on various standard benchmarks.

Workflow map

Users of high-end, high-volume workflow systems, which automate the flow of work companywide, could take a FlowModel diagram and use it as a building block for these workflow systems, said Kim Shah, president and chief executive officer of Arcland.

But this is only for systems that support Microsoft's Messaging Application Programming Interface. "It is not ready to integrate directly with workflow systems," said Nathaniel Palmer, an analyst at Delphi Consulting Group, Inc. in Boston. "But it is not

necessary to use for a prelude to automated workflow."

For example, one beta user described a simple way to map and track workflow without automating it.

Users could create a FlowModel diagram of an ongoing project and record their progress against the model by exporting data from FlowModel to Microsoft's Excel spreadsheet, said Pat Harty, vice president of finance and operations at STI Optonics, Inc. in Bellevue, Wash.

No-brainer

A Layout All feature in FlowModel lets users brainstorm a process without concern for design issues. The feature then automatically redraws the diagram into a coherent chart.

NT servers

CONTINUED FROM PAGE 45

Allchin, senior vice president of Microsoft's business systems division in Redmond, Wash. The next scheduled release of NT will be sometime next year. Cairo, the object-oriented version of NT, will be out in 1997, analysts said.

Allchin said NT already does well on eight CPUs. He agreed that NT needs to scale higher but refused to specify how and when that would happen.

However, the clustering of multiple NT servers, due to start next year, will ease scaling issues for NT, he said.

Temporary option

Clustering smaller NT servers may compensate for individual NT servers that have reached their capability limits, users said.

Microsoft is working with Compaq

Computer Corp., among other vendors, to do exactly this. At the same time, Microsoft and its open systems partners, such as Digital Equipment Corp. and AT&T Global Information Solutions, will work to make sure NT does even better on SMP scaling by 1997, analysts said.

Big bang

Sales of Microsoft's 32-bit NT operating system are booming, with more than 1 million copies expected to be sold this year. NT Server sales account for about 400,000 of the total units, analysts said.

Bunch of boxes

"The problem is that [NT] just runs out of speed at six to eight processors, so you have to go to a plethora of small boxes in clusters," said Colin Carpi, president of Chartwell Advisory Services, Inc. in Penn Valley, Pa.

The firm is building a large financial information services network.

The idea of clustering NT servers is fine with Carpi.

"It does [depend] on having very high bandwidth on your network," he said.

"The concept is to make a big machine out of a lot of little ones, but it's a different architecture. I think this makes all kinds of sense."

Senior editor Stuart J. Johnston contributed to this story.

Signatures

CONTINUED FROM PAGE 45

The keys are issued in tamper-proof "certificates" that also contain the key holder's name, address and other information.

The certificates can help facilitate trusted business transactions between parties that may or may not know one another.

VeriSign, Inc., one such certificate authority, said the ABA guidelines are a welcome relief from a plethora of conflicting ideas about digital signatures.

Web Augustine, vice president of marketing at the Redwood City, Calif., company said some states have already enacted legislation and more are in the process.

"There are many different interpretations of what digital signatures are and how they can be used," Augustine said.

After a decade of breaking down functional barriers in companies, why do we continue to keep structured and unstructured information apart? Relational databases are stuffed with structured information that is hard for non-technical business professionals, such as salespeople and managers, to access and use. Yet, unstructured information stored in e-mail messages, faxes, spreadsheets and word processing documents is an equally valuable source of corporate knowledge.

As demand for more strategic use of information grows, IT departments must respond with new business applications that unify structured and unstructured information and make it available for day-to-day business use.

Until now, the challenge has been how to leverage information in relational database management systems (RDBMSs) for a wide range of client/server applications. Recently, the rules have changed again. Today's critical applications must meet even tougher requirements: sophisticated workflow processing, enterprise-wide connectivity to customers and suppliers, and support of increasingly mobile users. The sticking point is that transaction-oriented applications are frequently difficult to enhance and modify, and are not architecturally designed to support these new application requirements.

Groupware has emerged as a technology that complements the strengths of RDBMSs. Most people know that groupware is designed to manage and distribute documents anywhere in the enterprise, but far fewer are aware that groupware can give users access to both structured and semi-structured information, regardless of location or computing platform.

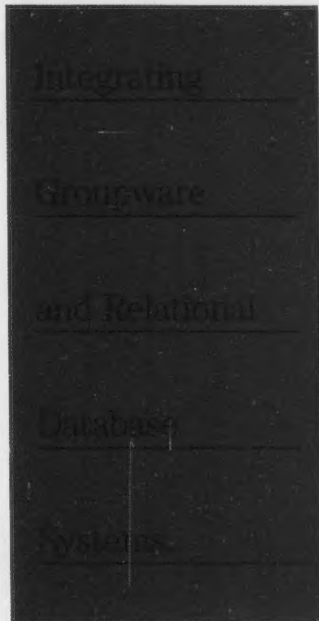
To integrate effectively with RDBMSs, a groupware product must:

- Offer a variety of straightforward database connectivity options

- Provide robust support of distributed workgroups and mobile users
- Enable workflow automation to move information through a business process.

Lotus Notes: A Hub, Not An Island

Lotus Notes® is the tool of choice for building high-return applications that



leverage relational and non-relational information. With a variety of data integration products to choose from, developers can now extend groupware applications to include relational data. For many business professionals, Notes' easy and intuitive user interface becomes the central launchpad to a universe of vital business information. For developers, there are flexible options for integrating data at the application level or even at the server-to-server or transaction level.

Notes™ supports access to the leading RDBMSs. And because Notes runs on all popular computing platforms and supports the leading APIs, you can quickly build applications to distribute and update

information — even application design updates — wherever it's needed.

The Payoff: World-Class Applications

Now applications can pull human resource information from transaction systems into Notes-based applications that automate the entire hiring process, from searching for candidates with specific experience to making job offers.

Companies can more effectively win competitive bids by quickly generating accurate and complete proposals integrating the latest cost information from transaction systems with the rich document authoring capabilities of Notes.

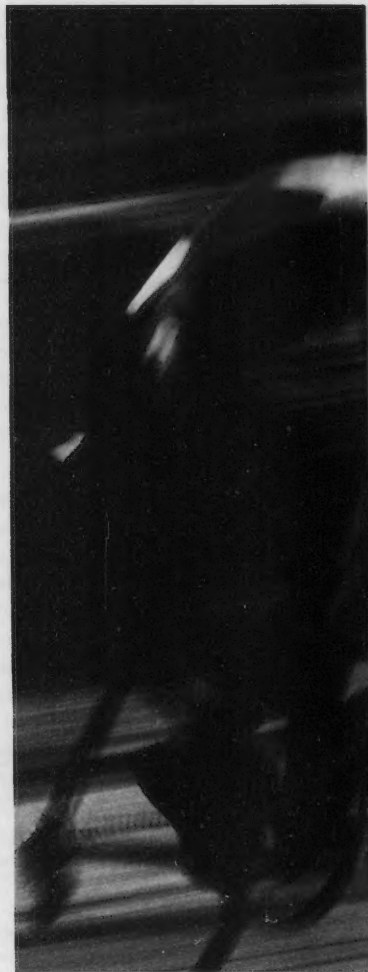
In hundreds of sales organizations, Notes fosters "virtual" team selling by coordinating the latest information gathered from such disparate sources as call reports, real-time news feeds and financial transaction data. Salespeople can continuously and securely update colleagues anywhere in the world with the latest customer or competitive information.

Field-based work crews can be managed more effectively when work order transactions are distributed via Notes. As jobs are completed, crews replicate updated information back to headquarters.

The technology may be sophisticated, but the point is simple: anywhere structured and unstructured information must come together to create business value and support critical decisions, there's only one groupware product that combines the ability to communicate, collaborate and coordinate with efficient, reliable RDBMS integration. **Lotus Notes.**

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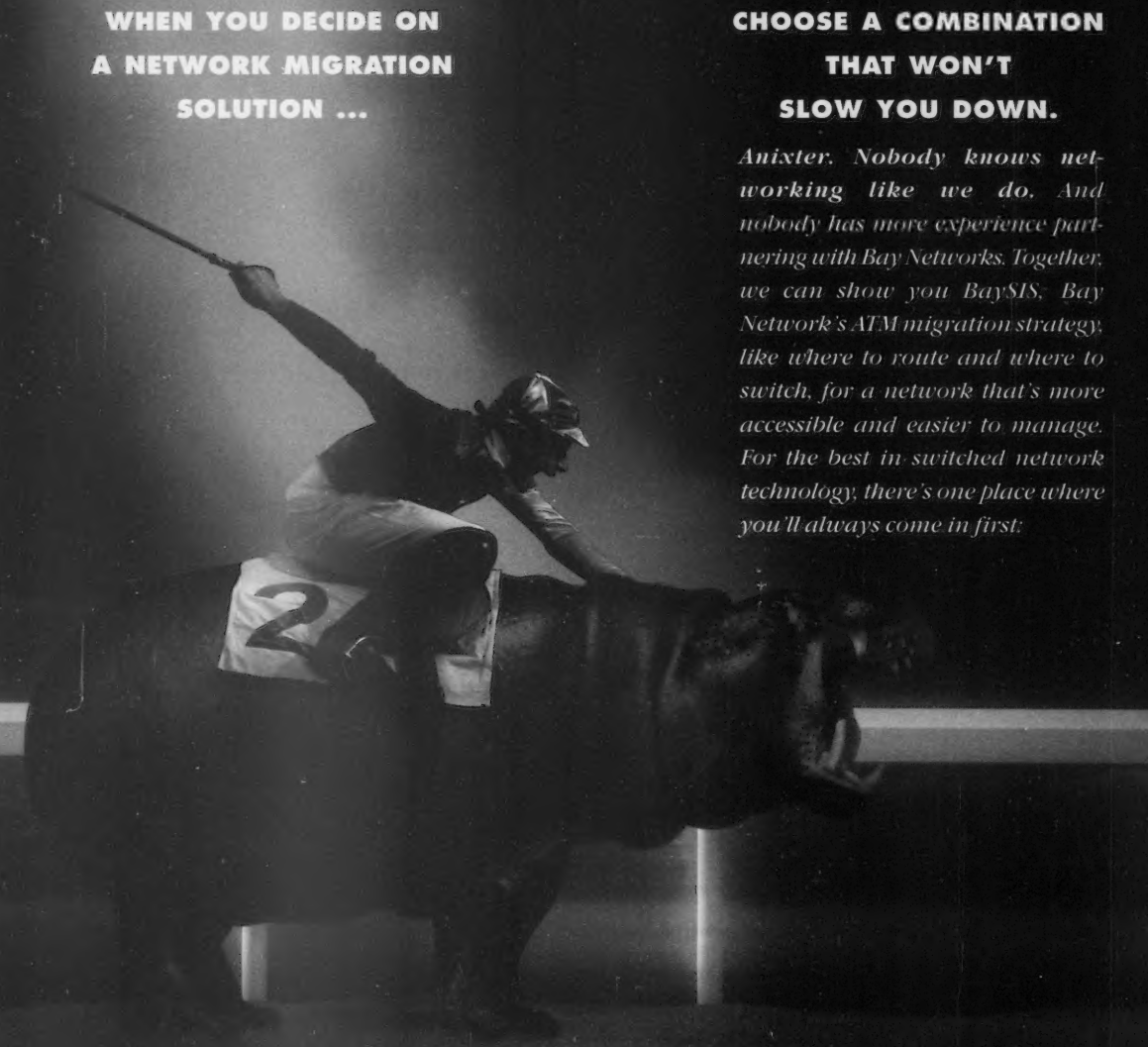
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Enterprise Networking

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Enterprise Networking

Micromuse cools network cacophony

By Patrick Dryden
DALLAS

In large distributed environments, "console chaos" can cause central management staff to miss critical alerts.

Client/server environments generate tons of information about networks, systems and applications. Users and analysts say revamped monitoring software from Micromuse USA can help administrators make sense of it all.

Netcool/Omnibus collects data from element managers and management platforms, filters duplicate alarms and correlates events so that support staff can define and manage specific functions. That means router and electronic-mail teams, for example, can have their own vir-

tual network monitors that warn them when a certain service is in jeopardy.

Version 3.0, introduced last week at Enterprise Management Summit 95 here, boosts performance, scalability and ease of operation through a complete rewrite of the prior Netcool/Omnibus software (see box, page 58).

Needle in a haystack

One beta tester praised the enhanced command interface because he could type in a rule or point and click to diagram a relationship for controlling alarms, according to Jill Huntington-Lee, an analyst at Data-pro Information Services Group in Delran, N.J.

Huntington-Lee said that is the kind of help needed to control growing networks.

"So many alarms happen in a command center that the staff needs a way to make important events rise above the noise," she said. "Writing scripts to fil-

ter alarms can take months, but Netcool/Omnibus does it on the fly and can work across platforms."

Broader platform support let

a beta-tester, whose corporate policy prohibits identification, run the monitor on Hewlett-Packard Co. HP-UX systems.

Micromuse, page 58

Digital adds firewall offering

By Michael Goldberg

Accessing the Internet for private communications is an alluring prospect for users looking to save money on leased lines while harnessing the reach of a vast public network. For those concerned with confidentiality and information security, however, the Internet looks more like a jungle than an interstate.

Digital Equipment Corp. has entered the growing field of vendors offering firewall and tunneling products that claim to employ data encryption and user detection techniques to create "virtual private networks."

In May, Digital introduced a series of firewall

products to regulate access from the Internet into a private network. Last week, the Maynard, Mass., company unveiled two tunneling products — The Internet Group Tunnel and the Internet Personal Tunnel—that can transport data across the Internet and through firewalls made by Digital and most other vendors.

Security

Observers said Digital's approach of separating the two technologies—the protective firewalls and enabling tunnels—is a departure from the status quo, whereby both capabilities are bundled into one package.

"Right now, tunneling is looked at as a value-added feature that's embedded with some other

Digital, page 58

ISDN, I presume? Livingston drops prices to rock bottom

By Bob Wallace

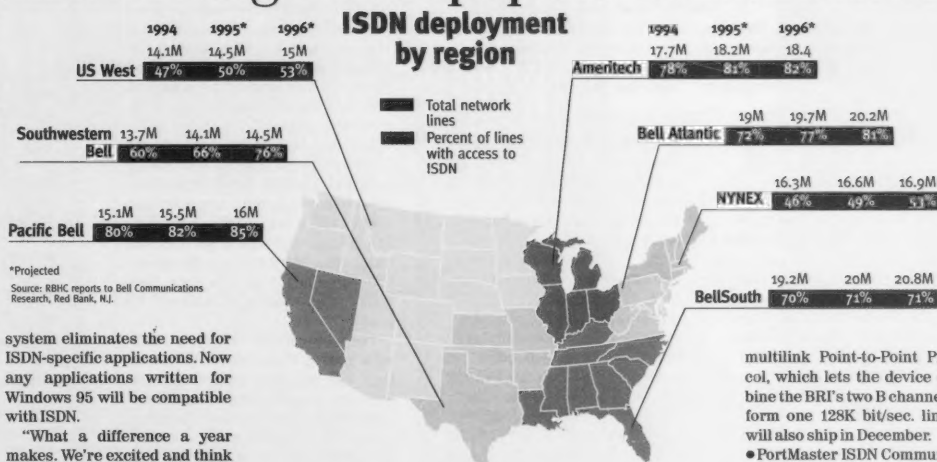
Livingston Enterprises, Inc. last week announced Integrated Services Digital Network (ISDN)-based remote access products that analysts said include the industry's lowest priced ISDN PC card.

Users say low-priced cards, combined with Microsoft Corp.'s recent commitment to support ISDN in its Windows 95 operating system and the Federal Communications Commission's efforts to reduce ISDN prices, are making ISDN very attractive.

The product family includes a \$299 ISDN modem card for Industry Standard Architecture bus PCs, an ISDN branch office router with an ISDN interface for \$1,195 and a remote access server that can support 10 ISDN lines starting at \$4,690.

"The PC card is easily the cheapest I've seen, with most similar products [priced] well over \$400," said Mike Pinneran, president of dBrn Associates, Inc., a Hewlett Neck, N.Y., firm that specializes in ISDN education and consulting. "And the pricing for the router seems very low."

Users said Microsoft's support for ISDN in its operating



system eliminates the need for ISDN-specific applications. Now any applications written for Windows 95 will be compatible with ISDN.

"What a difference a year makes. We're excited and think ISDN's on the right track. This market is really going to grow rapidly," said Bill Horst, chief of the General Services Administration's communications branch in Philadelphia.

A very big drop

The Pleasanton, Calif., company's announcement means users can get the performance increase of ISDN — more than four times that of dial-up lines — for several hundred dollars less per unit.

At \$1,195, the Livingston ISDN router costs \$800 less than a similar product from router market leader Cisco Systems, Inc.

Though not yet ubiquitous or consistently provided by vendors, ISDN Basic Rate Interface (BRI) service is available on more than 50% of each regional Bell holding company's (RBHC) total network lines (see chart).

The products include the following:

- The 128K bit/sec. PowerLink128 ISDN Modem for PCs with AT buses costs less than a V.34 modem, which only gives 28.8K bit/sec. performance.

- It supports Intel Corp.'s Plug & Play feature, which means the device automatically configures itself once it is installed. The product will ship in December.

- PortMaster ISDN Office Router has one Ethernet, one BRI and one dial-in port. It supports

multilink Point-to-Point Protocol, which lets the device combine the BRI's two B channels to form one 128K bit/sec. link. It will also ship in December.

- PortMaster ISDN Communications Servers were designed for large central sites and can be equipped with two five-port BRI modules. They support as many as 20 64K bit/sec. channels from remote users and come with 10 dial-up ports for users looking to support a mix of access links.

PortMaster ISDN Communications Server will ship next month for \$4,690 with five BRI ports and for \$6,685 with 10 BRI ports. Users can add five-port BRI modules to Livingston PortMasters for \$1,995 each.

Newspapers turn to Web for on-line help wanteds

By Gary H. Anthes

After a decade of small steps and meager returns, the newspaper industry recently got into the on-line recruitment advertising business in a big way.

Six of the nation's largest daily newspapers posted 21,000 help wanted ads to a common World Wide Web site, CareerPath.com. The Internet service, which is free to job seekers, includes a flexible search engine to locate jobs by geographic region, job category and keywords in job descriptions (see related story below).

The newspapers are part of the New Century Network, an Internet content development and distribution consortium founded in May by nine media companies. The newspapers are *The Boston Globe*, *Chicago Tribune*, *Los Angeles Times*, *The New York Times*, *San Jose Mercury News* and *The Washington Post*.

Analysts said the on-line service is unlikely to bring the newspapers significant revenue any time soon. Rather, they suggested, the newspapers

see the Internet as one way to protect their \$13 billion annual classified advertising market.

Some of the newspapers, such as the *Mercury News*, won't charge their print advertisers anything extra to

electronic classifieds, both from competitive reasons and market expansion reasons."

Arlen said computer access provides advantages over print media for classified advertising. "Say I am in

Washington, and I'm looking to move to Chicago. I can automatically search for a home in the \$400,000 range with four bedrooms, and so forth," he said.

"This is an investment in the future," said Miles Groves, vice president of market and business analysis at the Newspaper Association of America in Reston, Va. "If we don't develop our editorial and advertising products on-line, someone else will."

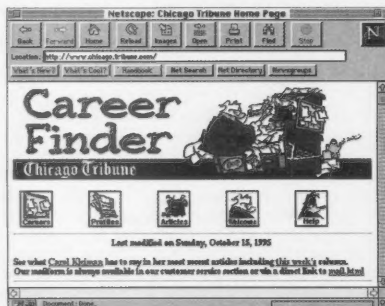
More than 100 U.S. newspapers have Web sites, and more and more are putting local classified ads on them, Groves said.

Follow the money?

Timothy Landon, a vice president at the *Chicago Tribune*, said the newspaper has had an on-line publishing venture under way with America Online, Inc. for some time. "We haven't made a ton of money," he admitted. "It's been hard to make revenue in the electronic market."

But that is beginning to change, Landon said. He said the *Tribune* set up a Web page for local recruitment advertising six months ago. Sixty percent to 70% of its advertisers pay the \$1-per-line surcharge to get their ads on the Web. "It will be a significant revenue stream for us this year, hundreds of thousands of dollars," he said.

The newspapers issued a statement saying they eventually will accept ads for Internet-only display. They also said they will enhance CareerPath.com to include company profiles and "alerts," which would notify an employer or job seeker when a candidate or job with a certain profile comes on the market.



The *Chicago Tribune* Career Finder features characters from Jeff MacNelly's comic strip *Shoe*

post the recruitment ads on-line. The *Chicago Tribune* will add a \$1-per-line surcharge to print ads that also go to the Web site.

"I don't see how they will make money from this," said Gary Arlen, president of Arlen Communications, Inc. in Bethesda, Md. "But it is real important that they figure out how to do

played four detailed job descriptions in that category, such as one from Dollar Rent-A-Car Systems, Inc. seeking someone knowledgeable about "car rental computer software."

But looking for "chief information officer" in all six papers turned up no hits after two minutes of searching.

The search engine ran out of gas after four minutes looking for "programmer" positions at all six papers. It displayed the message, "The search engine is unable to complete your query. Try submitting your query again."

— Gary H. Anthes

Where it's at

Six newspapers put 21,000 help-wanted ads on-line at <http://www.careerpath.com>. Users could select any or all of the newspapers, any of dozens of job categories and keywords for searching for job descriptions.

For example, a search of *The New York Times*' recruitment ads for job descriptions containing the word "computer" turned up 877 jobs in 57 categories from "accounting" to "warehousing."

A click on "management" dis-

Briefs

Find a bug, win a prize

Netscape Communications Corp. has announced a "bugs bounty" program that rewards users who find bugs in beta

copies of Netscape's Navigator 2.0 Internet browser. The first people to report a problem to the Mountain View, Calif., vendor can get cash, coffee mugs and other Netscape paraphernalia, depending on the severity of the bug. See <http://www.netscape.com> for more details.

Surfing on CompuServe

CompuServe, Inc. in Columbus, Ohio, has announced Spryte, a \$4.95-per-month program that lets subscribers surf the Internet. The program, which is due to be available by year's end, includes three

hours of dial-up Internet access per month plus the software to make it happen. Additional hours are \$1.95 each.

Secure middleware offered

WorkingSet, Inc. in Lexington, Mass., has announced

DataRamp, middleware designed to give users secure Internet access to data stored in corporate relational databases.

DataRamp uses encryption technology from RSA Data Security, Inc. in Redwood City, Calif.



WWW normally means World Wide Web, but this week it could be Wild, Wacky and Weird.

If you visit just one Internet Halloween site before going out trick-or-treating this year, visit the *Den of the Dead* at <http://ucsu.colorado.edu/~anschutz/dead.html>. There you will see various "ghastly activities," starting with two skeletons making love. But this is no porno site. You can download Halloween party hints and scary songs, shop for Halloween merchandise, read spooky stories and link to hundreds of other haunted Web sites.

One of those links is to *Phantasmagoria* (<http://mandrake.lib.lehigh.edu/>). You can bypass this one if you have anything less than a 28.8K bit/sec. modem and special "viewers" for processing pictures, sounds and video. The sounds—such as a woman's scream, dragging chains and a graveyard dog—are manageable at 100K bits or so. But you might want a direct connection via a T1 line for the 5M-bits-plus film clips and the three-dimensional graphics rendered by a Silicon Graphics, Inc. supercomputer.

Phantasmagoria can also get you to shareware Halloween games in .EXE and .ZIP files and to "chiller fonts" and "scream savers" in .ZIP format.

If you're into Godzilla, check out *Mark Meilon's Godzilla Page* at <http://www.am-a.caltech.edu/~mrm/godzilla.html>. (Why are all these servers at universities? Don't these kids have anything better to do?) Godzilla toys, movies, pictures and posters are available here.

You can buy body parts from the Halloween Mart in Las Vegas at <http://www.accessnv.com/halloween/>. A cutoff finger is just \$2.50, but a full size latex mummy will set you back \$135.

More "horror products" are available from Steven's Magic Emporium in Wichita, Kan., at <http://www.radiks.net/halloween/>. This is serious stuff: a 150,000-volt stun gun for \$80 and a fog machine—"ideal for haunted houses"—for \$999.99. I don't think we're in Kansas anymore, Toto.

The only site not likely to gross you out is the Virtual Haunted House at the *MidLink Magazine* site (<http://longwood.cs.ucf.edu/~MidLink/haunted.html>). There you will find charming and colorful Halloween pictures created by grade-school kids. This is what Halloween is all about.

— Gary H. Anthes



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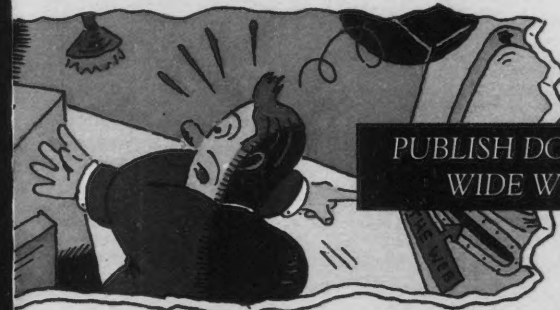
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Vines users seed regrowth of association

New England customers join to restore Banyan liaison

By Laura DiDio
BOSTON

A new Banyan Systems, Inc. Vines user group has taken root in the same Northeastern soil where a predecessor thrived and died.

The New England Enterprise Vines User Group held its first meeting two months ago. The fledgling organization fills the void left two years ago when the Massachusetts Banyan User Group (MassBUG) disbanded due to lack of support, said Bob Whelan, assistant director of networking at Northeastern University in Boston.

Whelan and a core group of about eight other regional Banyan customers were the driving force behind the new organization. They said they needed a way to get technical updates to regional users between the semiannual Association of Banyan User International (ABUI) meetings.

Plenty of interest

Whelan's contention that there was a "real void left by the dissolution of MassBUG" was proved true by the enthusiastic turnout at the September and October meetings.

More than 50 users from Massachusetts and neighboring

states went to each of the gatherings. Topics discussed included the technical ins and outs of Vines 6.0 and the integration of Vines with Microsoft Corp.'s Windows 95 and Windows NT Client.

"We felt that with technology changing so rapidly, it was a necessity to restart the user group locally," Whelan said. He said networks are getting "more complex by the minute," and quick feedback is a must.

Other users agreed that the new group helps them.

"I'm all for it," said longtime Banyan user Richard Kesner, chief information officer at Babson College in Wellesley, Mass. "ABUI is great. But there are a lot of Vines users in the academic community who can't afford the time off or the money to travel to exotic locales for large user group meetings."

Bill Sheehan, senior technical support specialist at Boston-based Stone and Webster Engineering Corp. and former president of MassBUG, noted the need to exchange technical information is "greater than ever."

"The only people who have a handle on the vagaries of the technology are my fellow network managers who are working in the same trenches I am,"

Sheehan said. He said the first two meetings served as "minutotutorials," which were especially valuable because he was able to learn from others' mistakes.

Second time's the charm

Sheehan and Whelan noted that the New England Enterprise Vines User Group won't fall prey to the same pitfalls that

punctured MassBUG.

MassBUG, the users said, died not for lack of interest, but rather because of meeting locations. Many users thought the group was run by the commonwealth of Massachusetts because the meetings were always held in downtown Boston, according to Whelan.

This time around, Whelan, Sheehan and the other six members of the Enterprise Vines User

Group Steering Committee polled the perspective membership during phone conversations on a variety of topics and decided to rotate meetings around suburban campus sites.

The next meeting is slated for Nov. 16 at Analog Devices, Inc.'s headquarters in Norwood, Mass. Anyone interested in attending may contact Whelan at (617) 373-4282 or by electronic mail at rwhelan@neu.edu.

Get the ball rolling

Starting a user group in your area doesn't have to be difficult or costly. Bob Whelan, assistant director of networking at Northeastern University, has the following tips:

- **Contact the vendor.** While vendors probably won't be willing to part with their mailing lists, many, such as Banyan, will be glad to announce the formation of a new user group in their on-line forums or newsletters.
- **Call prospective attendees.** Poll the potential user group membership to gauge their interest in the group and their preferences for

dates, times, locations and the most pressing topics to be discussed at meetings.

- **Make it relevant.** Once you have determined what the hot issues are, assemble a group of qualified speakers, such as engineers from the vendor or other knowledgeable users who can come prepared to answer technical questions.
- **Get feedback from the meeting.** Poll the membership using written forms at the end of the meeting to see what worked and what didn't.
- **Create an electronic mailing list of the user group.** This will let you send messages, addendums and calls for participation over on-line services such as the Internet and CompuServe.

—Laura DiDio

Micromuse

CONTINUED FROM PAGE 53

"This provides centralized alarm control for 4,000 devices that form a WAN for more than 10,000 employees," said the corporate network manager. "We tried some other correlation engines, but they were too hard to use or too expensive."

He said Netcool/Omnibus "messages" thousands of alarms gathered by the HP OpenView enterprise management platform from element managers for hubs, routers and WAN links.

Without Netcool/Omnibus and its intelligent filtering, the alarms "would soon fill the console screen," the user said.

The software's default set-

tings and customizable approach can help a management staff eliminate extensive training, said Sylvia Clark, senior an-

alyst at Aberdeen Group, Inc. in Boston.

Regaining control

Netcool/Omnibus gathers data from diverse management tools to help users deal with numerous and often duplicate alarms from their networks, systems and applications.

VERSION 3.0 OFFERS THESE ENHANCEMENTS:

- More supported platforms (SunOS, Solaris, AIX and HP-UX)
- Multithreaded support for multiprocessor servers
- More graphical and Boolean controls on console
- Tenfold performance improvement
- New probe software that gathers more alarms

A matter of time

Only those organizations with very large, complicated networks need Netcool/Omnibus now, Clark said, but more users will need help weeding out alarms as their networks grow more complicated.

To broaden the tool's appeal to Unix-leery managers, a version for Microsoft Corp.'s Windows NT is under development, said Mike Silvey, marketing vice president at Dallas-based Micromuse.

Netcool/Omnibus costs \$25,000 for the server with a new SQL-compliant data repository. Probe software kits to gather data cost \$7,500 each, and the client software costs \$7,500 per concurrent operator.

Digital

CONTINUED FROM PAGE 53

firewalls. This approach allows Digital, in theory, to say to users, you don't have to replace your firewall, you just have to install [Digital's] tunneling feature," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston.

Digital's Group Tunnel will link two or more private networks across the Internet, while its Personal Tunnel will link remote Microsoft Corp. Windows 95 PC users to private networks across the Internet. The software enables Internet servers to authorize user access by name and not just by IP address, which was designed to add security.

The Personal Tunnel software costs \$99. The Group Tun-

nel software costs \$4,995 and was designed for Digital servers running the Digital Unix operating system. Future versions will run on Microsoft's Windows NT, a spokesman said.

Matt Mancuso, manager of information security technologies at the Secure Systems Center of Computer Sciences Corp., works with businesses setting up computer systems linked to the Internet. He said he will recommend Digital's tunneling products for

companies linking branch offices and telecommuters to home office networks via the Internet.

Mancuso said he is worried, however, that tunneling technology in general makes some firewalls too porous. It may allow penetration into areas of a private network the owner did not intend visitors to see.



Security Dynamics Technologies, Inc. has introduced SecurID Key Fob.

According to the Cambridge, Mass., company, SecurID Key Fob is part of a family of network user authentication products that protect and manage access to computer-based information resources. It is a lightweight,

water-resistant token designed for securely accessing networks from environments outside the corporate office.

The product also works in conjunction with Security Dynamics' hardware and software access control products in order to authenticate users' identities. It provides network access to authorized users and locks out hackers and trespassers.

SecurID Key Fob displays a randomly generated access code that changes every 60 seconds. It provides two-factor authentication: The user logs in by entering a personal identification number, followed by the current code displayed on SecurID Key Fob.

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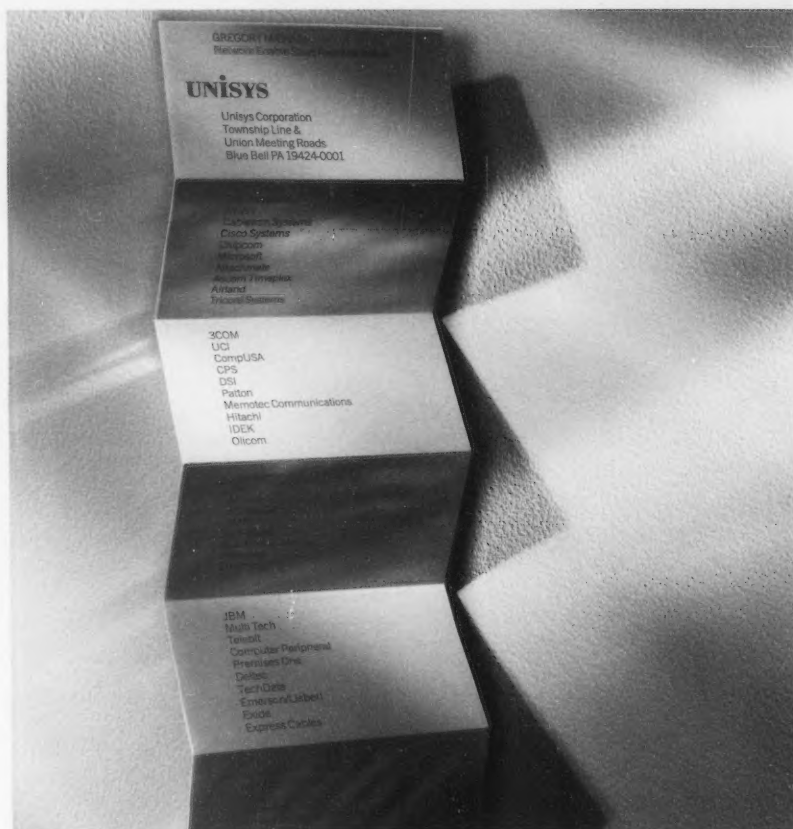
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Large Systems

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Large Systems

OLAP vendors at loggerheads

By Dan Richman

Everyone seems intrigued by on-line analytical processing (OLAP), a technology that lets end users scrutinize data with unprecedented thoroughness. But a major schism is forming among vendors over how best to deliver that technology.

One camp comprises vendors of multidimensional database management systems (MDBMS). MDBMS vendors were the first to popularize the term "OLAP," forming the OLAP Council in Boston to promote this technology and putting their products on the market about two years ago.

These products use their own data stores—often proprietary—into which data must be copied or moved before it can be analyzed. MDBMSs are quick because they use pre-aggregated data, or data that has been summarized or precalculated in some other way.

Another way

An emerging alternative to MDBMSs is what Bob Moran, a senior analyst at Aberdeen Group, Inc. in Boston, has dubbed "relational OLAP," technology that provides multidimensional analysis against data that remains in a relational database management system. This category of OLAP products works with wares from Sybase, Inc., Oracle Corp. and others.

MDBMS-based OLAP products have some limitations. Pre-aggregation limits their query flexibility, and it is widely reported that they bog down approaching 50G bytes. They also lack the security and administration features of major RDBMSs; that limitation becomes more critical as MDBMSs grow in importance in an organization.

Further, MDBMSs require additional training and expertise to set up and administer. They have limited ability

Data analysis

to drill down into the data and show end users how a conclusion was reached. And MDBMSs need dedicated tools, although the OLAP Council last week announced a draft specification for an application programming interface that allows tools to access all compliant MDBMSs.

Relational OLAP products have their own set of pluses and minuses. There is no need to copy or move the data into a specialized DBMS, no need for pre-aggregation and no additional administration. They can also use a variety of tools. Sites retain full control over access and security, and the only limit on a database's size is that of the RDBMS.

On the downside, relational OLAP products often run more slowly than MDBMS-based products. Some MDBMS advocates even go so far as to say RDBMSs are inherently, techno-

DB2's radical redo

IBM updates database to stay in step with the times

By Craig Stedman

Mainframe DB2 is about to shed some of its dowdy legacy trappings and take on a more with-it database look.

IBM's signature relational database will get a major makeover when a long-promised update finally ships late next month. Version 4.0 of DB2 for MVS is a key piece of the computer giant's campaign to dress up System/390 mainframes so they don't look like out-of-place rubes in these client/server times.

The new version adds support for stored procedures and other modern features that until now have been the province of rival databases running on smaller systems. It also lets clustered System/390s share pools of DB2 data; those shared data pools are a key requirement for moving IBM's so-called "parallel sysplex" clustering technology beyond a hardy band of early adopters (see chart).

More is better

The sysplex concept provides a way to spread applications across multiple mainframes to get more raw power and protect against system crashes. Sysplex customers who are beta-testing DB2 Version 4.0 said the data-sharing support allows them to install IBM's new air-cooled 9672 models, which aren't powerful enough yet to take on heavy workloads by themselves.

Toronto Dominion Bank installed the new DB2 release in August and plans later this year to start sharing branch banking data between

Can you relate?

The following new features are included in Version 4.0 of IBM's DB2 for MVS relational database

DATA SHARING

Up to 32 clustered mainframes can share a common pool of DB2 data.

STORED PROCEDURES

A SQL interface lets users create automated series of processing steps.

PARALLEL QUERY PROCESSING

CPU-intensive queries can be split into multiple tasks that run in tandem.

ROW LOCKING

A single row of data is closed during transactions, reducing end-user contention.

CONCURRENT COPY

Backup copies of DB2 databases can be created on the fly with a brief freeze of data.

OUTER JOINS

Nonmatching data is automatically combined in query responses, reducing programming burden.

a 10-processor air-cooled system and one of its more expensive water-cooled ES/9000s, said Phil Zita, sysplex project manager at the Toronto-based bank.

"We were heading toward exceeding the capacity of our single [ES/9000s], so we needed to go to horizontal growth instead of vertical growth," Zita said. Data sharing "lets us exploit [air-cooled technology] to get at the cost breaks" that stem from IBM's switch to CMOS

DB2, page 64

What is OLAP?

On-line analytical processing is a data analysis technology that does the following:

- Presents a multidimensional, logical view of data to the end user with no requirements as to how the data is stored.
- Sorts, forecasts, tracks trends and performs other complex analyses.
- Lets users move from one query to another and get results quickly and easily

A query that doesn't require OLAP is "How many shoes did we sell last month?" One that does is "How many size 10 shoes in red did we sell last month in the Midwest, the Northwest and the Southeast, compared with that same month last year, actual vs. budget?"

The above definition comes from the OLAP Council, a vendor group in Boston. Another, far more complex, definition is available from database theorist E. F. Codd; it contains 12 criteria for a technology to be considered OLAP [CW, July 26, 1993.]—Dan Richman

The Great Divide

Multidimensional OLAP products (Contain their own DBMS)

VENDOR	PRODUCT
Kenan Technologies Cambridge, Mass.	Acumate ES
Arbor Software Sunnyvale, Calif.	Essbase
Oracle Redwood Shores, Calif. (through IRI Software)	Express
Holistic Systems Edison, N.J.	Holos
Dun & Bradstreet Software Framingham, Mass.	Pilot

Relational OLAP products (Run against major relational DBM)

VENDOR	PRODUCT
Information Advantage Minnetonka, Minn.	Axsys
Prodea Software Eden Prairie, Minn.	Beacon
Microstrategy Vienna, Va.	DSS Agent
Stanford Technology San Francisco	Metacube
Sagent Technology Menlo Park, Calif.	Product not yet named

logically incapable of providing OLAP.

Users of both types of products tout the virtues of the OLAP, page 64

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Which is why, at the recent Enterprise Management Summit, the RISC System/6000® and other UNIX systems were put through 14 grueling tests on managing complex multivendor environments. When the dust settled, only one company was able to outperform HP®, Groupe Bull®, Computer Associates® and Digital®. And that company is IBM.

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Large Systems

Start-up hopes for room in reporting tool market

By Dan Richman

A 2-year-old Silicon Valley start-up is betting there is room for its forthcoming reporting products even in a market crammed with 25 competitors.

Actuate Software Corp. said its suite of six reporting tools differs from competing products — particularly SQR Workbench from Management Information Technology, Inc. in Long Beach, Calif., and Focus from Information Builders, Inc. in New York — in two ways.

One difference is a small database accompanying each report that allows users to analyze the data it contains. That isn't possible with conventional, static reports. The second difference is that after information systems personnel or power users construct reports, end users can break apart their functional components and reassemble them to fit their changing needs.

These are genuine distinctions, even in a crowded market,

users and analysts said.

"I was extremely impressed by the technology. It was better and different than other products of the same type that I've seen. The real constraint is how quickly they can get it out there and who they can attract as partners," said Hugh Bishop, director of emerging technologies research at Aberdeen Group, Inc. in Boston.

"So far as I know, there's nothing else out there that provides production reporting on a large enough scale to accommodate an entire organization but also includes hypertext capabilities and other client/server niceties," said Craig Johnson, a manager of technology planning and development at Kaiser Permanente Health Plan, Inc., a health maintenance organization. Kaiser Permanente is evaluating Actuate's wares.

By year's end, Actuate will ship three products: Developer Workbench (\$1,999), which will enable developers to create

functional components called Report Objects in a dialect of Basic; End-User Desktop (\$199), which end users can use to create ad hoc queries; and Viewer (free), which end users can use to access data with Report Objects.

The company will deliver by April 1 its End-User Workbench (\$599), which lets power users customize Report Objects; Report Server (\$1,500 and up), which puts Report Objects on a network; and Administrator Desktop (\$599), the user interface to Report Server.

Actuate's products can run under Windows or in a client/server configuration with Windows clients and a server running under Hewlett-Packard Co.'s HP-UX, IBM's AIX, Sun Microsystems, Inc.'s Solaris for SPARC or Microsoft Corp.'s Windows NT. The products natively access data in Sybase, Oracle, Informix and Microsoft SQL Server and offer Open Database Connectivity access.

OLAP vendors at loggerheads

CONTINUED FROM PAGE 61

choices.

"We chose Beacon from Prodea [Software Corp.] because it will go against any database we want, even [Microsoft Corp.'s] FoxPro," said Jerry Colfer, director of sales technology at Johnson & Johnson in New Brunswick, N.J.

"I've heard the arguments in favor of a unified front end and MDBMS, but I haven't seen anything to support their higher-performance claim."

Eric Klusman, a vice president at Cantor Fitzgerald Securities in New York, praised Arbor Software Corp.'s Essbase MDBMS as efficient and quick and said he isn't sure he could get similar performance from relational OLAP.

Decision time

There is no clear difference in cost between the two camps, and there are plenty of details that make product comparisons difficult. So how to choose?

As if it weren't already difficult, within the next year or so major RDBMS vendors will likely integrate OLAP capabilities into their products. Oracle this summer bought IRI Software in Waltham, Mass., which sells an MDBMS-based product. It is unclear how that will be integrated with Oracle's RDBMS.

Informix Corp.'s path is clearer. Sources say it is expected soon to acquire the Stanford Technology Group in San Francisco, which produces a relational OLAP product called Metacube.

Users may be able to have the best of both worlds. Moran suggests using MDBMSs for compute-intensive

queries such as what-if scenarios and using relational OLAP for "browsing" data in more conventional decision-support environments. Moran said he believes the role of MDBMSs in the future may be limited. He added that relational OLAP likely will become the more mainstream technology.

There is no clear difference in cost between the two camps, and there are plenty of details that make product comparisons difficult. So how to choose?

Briefs

IBM leasing extended
IBM Credit Corp. has extended to year's end a special financing and upgrade program for buyers of the company's AS/400 Advanced Series midrange systems. The Advanced Power Lease program was scheduled to expire Sept. 30. The program offers interest rates as low as 4.9% and a new 90-day deferral of first payments. It also includes an option to upgrade to IBM's new 64-bit RISC AS/400 models without changing payment terms.

Warehouse trio teams
Informix Software, Inc., KPMG Peat Marwick and Digital Equipment Corp. will cooperate on a data warehouse product and services offering. The effort will use 64-bit addressing for large Informix relational databases.

BMC takes legal action
BMC Software, Inc. in Houston has filed a lawsuit in a Texas county court seeking to

prevent seven former workers from using its technology in products being developed by their new employer, Peregrine Systems, Inc. in Carlsbad, Calif. Peregrine is headed by John Moores, a co-founder and former chairman of BMC. Moores, who left BMC in 1992, isn't a target of the suit.

Sony shows jukebox
Sony Electronics, Inc. in San Jose, Calif., last week introduced a high-performance, rewritable optical disc jukebox. The OSL-6000 has 460 platters and provides 78G bytes of storage. The product is slated to ship by the end of October at list prices of \$17,500 for a two-drive unit and \$23,000 for a four-drive unit.

Software team forms
Boole & Babbage, Inc. in San Jose, Calif., and Peregrine Systems, Inc. in Carlsbad, Calif., has announced a partnership to integrate Boole & Babbage's Command/Post systems management software with Peregrine's ServiceCenter help desk software. A common interface be-

tween the two products allows enterprise-wide alarms and alerts to be directed to a central help desk.

HDS moves into PCs

Striking out beyond the mainframe market, Hitachi Data Systems Corp. recently introduced its first disk and tape storage devices for Unix systems and PC LANs. The Santa Clara, Calif., company announced the HDS 5700 disk array, which supports up to 336G bytes of capacity; the HDS 5400 tape subsystem; and a HILANDer LAN backup device. HDS is trying to set up a network of resellers to handle most sales of the SCSI-based devices.

Borg honored

The Association for Women in Computing has presented its 1995 August Ada Lovelace Award for Excellence to Anita Borg at its annual meeting in Reno, Nev. Borg, an internationally recognized expert on computer operating systems, is a consultant engineer at Digital Equipment Corp.'s Network Systems Laboratory in Palo Alto, Calif.

CONTINUED FROM PAGE 61

microprocessors, he added.

Southern California Edison Co. in Rosemead, Calif., also will start using the data-sharing capabilities late this year in a sysplex combining two 9672 machines with an ES/9000. The machines will run a new DB2-based customer service application that couldn't fit on a single system, said Mike Sigal, DB2 database and strategy planning consultant at the utility.

On par with Unix

Stored procedures and the other new features that put Version 4.0 on a more functional par with Unix databases also should make working with DB2 easier and more productive, Sigal said. "There's a lot of things in there that our application developers have been looking for," he said.

"Version 4.0 gives us a completely new set of tools to work with," said Carl Gerberich, vice president of information services at Marist College in Poughkeepsie, N.Y.

DB2 gets radical overhaul

CONTINUED FROM PAGE 61

Storing strings of database procedures in DB2 will reduce the need for client-level coding, and the ability to break up queries into parallel tasks should help speed processing, Gerberich said.

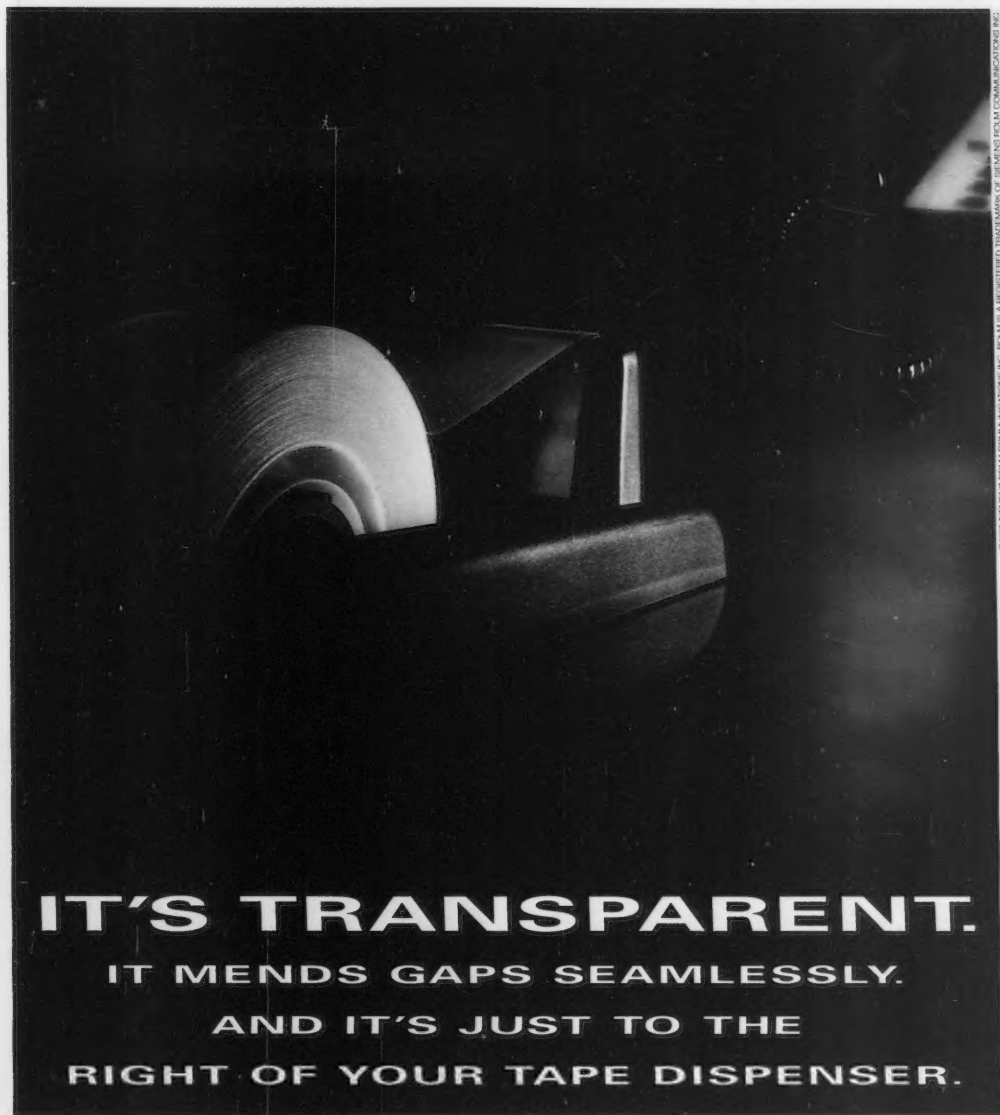
Marist, which has a single mainframe, began implementing DB2 in September for an application that lets faculty members use video in their teaching. The college is using an earlier release of DB2 but will go to Version 4.0 as soon as IBM tests the database with its digital library products, Gerberich said.

The data sharing and parallel querying enabled by DB2 Version 4.0 gives IBM "a mammoth server capability" that makes System/390s more amenable platforms for data warehousing and other decision-support applications, said John Young, an analyst at The Clipper Group, Inc., a consultancy in Wellesley, Mass.

But IBM must overturn the perception that warehousing data on a mainframe "just isn't cool," Young added.

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WITH LARGE APPS, 72
NEW PRODUCTS, 72

Application Development

CASE • LANGUAGES • TOOLS

C++ slowly makes the grade in IS shops

By Frank Hayes

Can C++ make it in corporate information systems?

The object-oriented language based on C has gained a foothold in industries noted for using leading-edge technology, such as financial and telecommunications companies. But its use isn't nearly as widespread as Cobol, PL/1 or other IS standards.

C++ has a reputation for encouraging programmers to write code that is hard to understand and maintain. Critics say the language lacks features that corporate developers need. For example, Cobol includes built-in features for database access, while C++ requires additional code libraries to perform those functions.

Fad or not?

While C++ is used in 20% of the large corporate development shops recently surveyed by Forrester Research, Inc. in Cambridge, Mass., others still dismiss it as a passing fad.

"Our MIS department doesn't know the first thing about C++," said Jim Cash, general manager for technical services at Co-Steel Raritan, Inc. in Perth Amboy, N.J. "The only thing they know is that it's the third letter of the alphabet."

Nor is C++ universally embraced among financial organizations. "We've looked at object-oriented languages, but this stuff just isn't ready for prime time," said one developer at a Chicago bank.

Even so, there are signs that C++ is making headway, even among the most traditional IS organizations.

"When we recently asked [50 large organizations] what their top general development tools are, we got the usual suspects, like PowerBuilder, Visual Basic and Cobol. But there were also about a dozen people who mentioned C++," said Rick O'Herron, a research associate at Forrester's software strategies service.

In part, that is because vendors are answering complaints about the shortcomings of C++. Improved C++ class libraries now provide many of the database and transaction features that IS departments need for their applications, and some C++ development systems now

feature visual rapid-development environments.

To make C++ more appealing to corporate developers, two vendors recently announced the following:

- ProtoView Development Corp. in Cranbury, N.J., next month will begin shipping ProtoGen+ 5.0, a graphical rapid-development environment that generates C++ instead of an interpreted scripting language. The tool set, which runs on Microsoft Corp.'s Windows 3.1, Windows 95 and Windows NT, costs \$1,999.

- Rational Software Corp. in Santa Clara, Calif., next month will roll out Rational Apex C/C++, a structured environment for C++ development. The Apex environment, which can link to Rational's Rose object-oriented design system, runs under Unix and starts at \$7,500.

Even the strongest supporters of C++ recognize that experienced Cobol programmers are in much greater supply than C++ developers. "It's not [like] there are 70 million people who can write code in C++," said Vimal Chowdhry, chief financial officer at Mount Clemens General Hospital in Mount Clemens, Mich.

Productivity gains doubtful

Yet another problem for C++ is that, while it is a powerful language for building client/server applications for Macintoshes and Windows-based PCs, it is still just another language that isn't likely to dramatically boost programmer productivity.

"Mainframe programmers don't want to learn assembler all over again," said Mark Simons, vice president of operations at Integrated Software Solutions, Inc. in Ellicott City, Md. As a result, many IS shops are building Windows-based applications using visual rapid-development tools such as Powersoft Corp.'s C++, page 72

@ Talkback@cw.com

Do you think C++ is ready for prime time? Is it used at your workplace? What does C++ need to make it something you would use? Sound off to us at talkback@cw.com. Please include your full name. We will publish a sampling of reader opinions in an upcoming issue.



Cmdr. J. R. Kennedy (left) and Deputy Frank Baker of the Hillsborough County Sheriff's Office in Tampa, Fla. Kennedy and his team of 10 programmers design applications to improve crime fighting and save money.

Sheriff's office fights crime with help from Mapper tool

By Neal Weinberg

Successful crime fighting takes street smarts, intuition and plenty of legwork. At the Hillsborough County Sheriff's Office, it also takes Mapper, the venerable Unisys Corp. application development tool.

J. R. Kennedy, commander of data operations at the 900-deputy, Tampa, Fla.-based sheriff's office, has a SWAT team of 10 programmers who write between 10 and 15 applications a year using Mapper.

According to analysts, Mapper hasn't made much of a dent outside Unisys' installed base. But users such as Kennedy, who has a Unisys mainframe, say Mapper is just the ticket.

Beginner jitters

Kennedy said when he came on board in 1990, he was unfamiliar with and skeptical of Mapper. But over the years, he has become a convert.

"Newer things have the bells and whistles, but the Unisys stuff keeps working and working," said Sandy Taylor, an analyst at The Standish Group International, Inc. in Dennis, Mass.

Col. Daron Diecidue, who heads administration support services, said Mapper has developed such a strong track record that there are

currently 40 requests for new programs. One of Diecidue's duties is to select the 10 to 15 top priorities for the development team to attack in any given year. Those include everything from a new payroll system to keeping track of the 2,000 civil papers served every month. "People want more and more," he said.

But is it beneficial?

In terms of measuring the cost benefits, Diecidue said it is difficult to put a dollar figure on people the department doesn't have to hire or time saved in the crime fighting process. But he said using Mapper-based programs has become "a way of life" for the sheriff's deputies.

And that permeates just about every aspect of the department. Kennedy has taken incident reports, fingerprints, mug shots and other crime-related information and put together systems aimed at making life easier for the cop on the beat.

For example, when a 911 call comes in, a computer-aided dispatch system displays the address of the caller and tells the dispatcher which patrol car is closest to the scene. The information is sent electronically to a terminal mounted on the cruiser's dashboard, cutting response time.

Mapper, page 72

ON SITE
Hillsborough County Sheriff's Office
Tampa, Fla.

Challenge: To use database management applications to improve efficiency and control costs.

Solution: Unisys' Mapper application development and decision-support query system.

Results: A computer-aided dispatch system that eliminates the need for 26 additional dispatchers, saving \$3.1 million annually. And an electronic incident report system that handles 125,000 documents a year, saving \$145,000 a year.

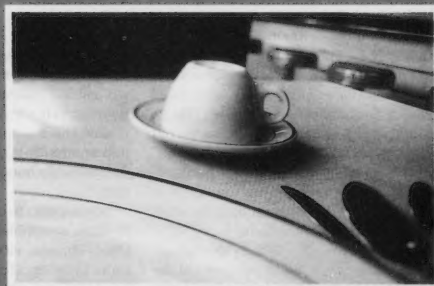
No, I didn't get lunch. Or dinner. All I got was 13 hours with a pile of documents, each with its own set of editorial comments. Which meant I had to coordinate hundreds of comments on a dozen plans that had now become a rainbow of highlighter marks and chicken

Why the only thing I had
to eat today was a week-old,
slightly linty sourball.

scratches I could hardly read let alone agree with. So there I sat, page by page, plan by

plan, muttering things under my breath while time

passed and the sun went down and the cleaning guy



packed up his floor polisher and went home, while I sat at my desk looking frantically

for those sourballs I had in my sportcoat pocket. Because a guy's gotta eat, you know?

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Application Development

Latest Smalltalk version eases developers' woes with large apps

By Frank Hayes

Smalltalk applications are big with corporate developers — and that's a problem.

Smalltalk is gaining popularity in information systems departments because it lets developers produce applications faster than with other object-oriented languages such as C++, users say. But Smalltalk also tends to generate much larger applications than C++, and it generates them as single, big programs that require significant amounts of memory and disk space.

And deploying those big Smalltalk applications can be a real challenge.

"You can't just distribute a 12M-byte client [program] to all the systems on a network very easily," said Matt Rosen, assistant director of technical services at San Joaquin Delta College in Stockton, Calif.

Hoping to ease that problem, Smalltalk vendor ParcPlace Digital, Inc. in Sunnyvale, Calif., has rolled out a new version of its VisualWorks Smalltalk development system. VisualWorks 2.5 lets developers break an application into a set

of smaller components. That removes a major stumbling block for corporate developers, making it much easier to slim down fat clients, users said.

With the release, developers can leave out unneeded features from Smalltalk applications. For example, if only Windows-based PCs are used as client systems, developers can remove support for Macintosh and Unix user interfaces, making the code smaller, said John Shoun, an IS adviser at Nortel, Inc.'s object technology center in Research Triangle Park, N.C.

And when it is time to distribute enhancements and bug fixes, developers can choose to change only the individual components that are affected.

"You don't have to deploy the application as a single large image. That really simplifies updates," Shoun said.

VisualWorks 2.5 also adds support for foreign languages as well as improved performance with Oracle Corp., Sybase, Inc. and IBM DB2 databases.

The new release, which is shipping now, costs \$2,995 on PCs and Macintoshes and \$4,995 on Unix platforms.

But while Smalltalk is becoming increasingly popular, corporate developers are still more likely to view C++ as their top object-oriented tool, according to Forrester Research, Inc. in Cambridge, Mass. Smalltalk

still has some limitations, users said.

One remaining problem is that Smalltalk systems still don't make it easy enough to develop distributed applications.

"It's a little clumsier than you'd hope it would be with objects on both ends," Rosen said.

Another difficulty is that unlike C++, which compiles to executable code, Smalltalk is interpreted, much like Powersoft Corp.'s PowerBuilder or Microsoft Corp.'s Visual Basic.

"The performance could be better," Rosen said. "But the rapid development we get with Smalltalk is more important to us than the performance we lose."

C++ is typically used in system-level work, while Smalltalk is used for business applications.

C++

CONTINUED FROM PAGE 69

PowerBuilder and Microsoft's Visual Basic, he said.

Still, C++ is gradually being accepted in corporate development shops. The biggest factor behind this simply may be that these shops are learning how to use object-oriented languages such as C++, Object Cobol and Smalltalk.

"Some of the C++ products give you a good baseline, a good jump-starting point with object classes to get moving with," said Bill Noffsinger, application development manager at the University of Florida at Gainesville.

But a year ago, development was focused almost completely on Cobol, he said. Today, the university uses some C++ and Cobol.

"I think IS organizations as a group aren't quite as anxious about C++ as they were a couple years ago," Noffsinger added. "It's not quite as verboten as it was before."

Mapper

CONTINUED FROM PAGE 69

If a suspect is arrested, a color photograph is taken and added to a database of 450,000 mug shots. Deputies and witnesses to crimes can access the photo database and conduct queries based on physical characteristics.

In addition, fingerprints are sent to a special shop that can match a suspect's prints with others on file. This procedure is useful if the suspect uses a phony name or is wanted for other crimes, Kennedy said.

Keeping track

There is also a master name index that keeps track of every contact an individual has with the department, a database of stolen vehicles and a mapping system that lets investigators plot the locations of recent burglaries, for example.

Kennedy developed an electronic-mail system that lets deputies message one another on mobile digital terminals be-

cause officers who work different shifts in the same geographic area needed a way to pass on updates. The sheriff's office also operates the county jail, and Kennedy worked out tracking systems that keep an eye on everything from supplies to the whereabouts of prisoners on an hourly basis.

Ready and willing

Police officers aren't required to come in and do database searches, Kennedy explained, but his staff of developers are waiting to help. And deputies who routinely use the system quickly become proficient, he said.

In some aspects of his operation, Kennedy uses the latest technology. He has a frame-relay network connecting 12 locations, from substations to three different jails. He plans to install an Asynchronous Transfer Mode switch.

But for application development, he is sticking with Mapper.

"It's so old, people don't think about it," he said. "But it works very well."

Talarian Corp. has introduced SmartSockets, a message-oriented tool kit.

According to the Mountain View, Calif., company, SmartSockets is a middleware tool kit for interprocess communications and was designed for developers working on internal projects.

SmartSockets handles network interfaces and communications protocols, guaranteeing delivery of messages and managing recovery after network problems. It includes tools for developing, testing and controlling all of the programs that can be involved in a networked application.

SmartSockets features visual interprocess communications monitoring and publish-subscribe communications. It also includes automatic data conversion, an object-oriented application programming interface, a C++ class library and debugging tools.

Pricing for SmartSockets starts at \$3,000.

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(415) 965-8050

Datageneration, Inc. has introduced Generator 3.0, a cross-platform tool for creating design, test and production data for application programmers and database developers.

According to the Cape Elizabeth, Maine, company, Generator 3.0 reduces hours of data input and programming by automatically creating millions of data records. Users define any type of data value and select a data fill type, creating a data file to populate and test applications.

Generator 3.0 includes 23 data fill types and new field and record delimiters. It includes a messaging manager for interprocess communication of generation events, with timing estimations and runtime duration messages for sample and production runs.

Generator 3.0 costs \$189.

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Responsive Software, Inc. has introduced ZipTitle.

According to the Berkeley, Calif., company, ZipTitle lets software developers include a Title Shield on applications. Users create a bit map for their product's Title Shield, or use a stock photo, and call a ZipTitle function to display the shield during the initialization phase

of the application. ZipTitle performs the bit-map transfers, displays version information, responds to errors during start-up and synchronizes multiple windows. ZipTitle also lets developers use 256-bit color images for title shields.

ZipTitle costs \$49.
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Bytech Business Systems, Inc. has rolled out PrintWorks, a custom control for Microsoft Corp.'s Visual Basic.

According to the Pomona, N.Y., company, PrintWorks lets users create, preview and print documents of any kind. One line of code launches a built-in preview window for screen display and printing.

This preview window lets users zoom in or out, scroll and print pages. It uses a Windows Dynamic Link Library written in C++ to process documents. It was designed to save time programming code; one line of code can format an entire paragraph.

PrintWorks creates output by drawing it, not by using graphics controls or executing a form print, which can drain resources.

PrintWorks costs \$149.
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Interactive Development Environments, Inc. has introduced STP/OMT Toolkit, a code-generation tool set designed for large development teams.

According to the San Francisco company, STP/OMT Toolkit is an object-oriented analysis, design and code-generation tool set. This latest version of the tool kit includes groupware tools that support large team collaboration, including a feature that automatically maintains consistency of objects and object models.

STP/OMT Toolkit features a messaging system that works across a network to notify developers of updates and includes a multiuser object model repository, which lets multiple developers simultaneously view, edit and update object models.

The product has a collaboration window that lets multiple remote developers collaborate on designs and reviews while viewing the same evolving model through videoconferencing.

STP/OMT Toolkit costs \$12,000.

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Giant home center
retailers must
deliver know-how
with their vast
inventories.
But is information
technology . . .

the right tool for the job?



Richard Nawrot, senior vice president of IS at Payless Cashways, says his chain's information-intensive service efforts might benefit from technology

By Brian McWilliams

With their broad interiors, low prices and vast selection, home improvement centers such as The Home Depot, Inc. appear to follow the strategy of Wal-Mart Stores, Inc., Costco Wholesale Corp., BJ's Wholesale Club, Inc. and other warehouse-format retailers.

But these home centers, which cater heavily to do-it-yourselfers, face a different challenge than other brightly lit repositories for commodity products.

"We bundle what we sell with know-how. In a lot of ways, we're in the service business," says Ron Griffin, chief information officer at The Home Depot in Atlanta. That means The Home Depot, the market leader with sales of \$12.4 billion last year, needs to give its customers a lot of information.

While information systems managers across the home center segment share that view, they don't agree on the role information technology should play in delivering such customer service. On page 80, technology proponents and skeptics have their say.

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**(Ours is the one without
the \$200 million ad budget, the
British rock band and
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Retail Technology

It's the personal touch that counts

Home centers today rely primarily on salespeople, not technology, as conduits for value-added information. By and large, that approach has worked. The Home Depot's orange-aproned sales associates played a major role in helping the company earn *Fortune* magazine's Most Admired Retailer award this year.

Count The Home Depot's CIO Ron Griffin among those who doubt whether the expense of service-oriented systems will translate into improved service levels or increased business.

"Retail is detail," he says. "You differentiate yourself through quality of execution."

The Home Depot has historically eschewed glitzy customer service applications, such as kiosks, in favor of what Griffin calls invisible applications. These include inventory management and labor scheduling systems.

IS operations are humming behind the scenes in The Home Depot's 364 stores in 30 states. The big stores, or boxes, as smaller store operators refer to them, typically cover about 100,000 sq. ft. and stock nearly 50,000 different products. For IS, the focus is on tracking those products.

Griffin thinks home centers haven't taken inventory management to the limit. He says The Home Depot's stock turnaround rates are very high compared with those of competitors in the industry. But he says there is room for improvement in areas such as receiving and perpetual accuracy.

"Competitive advantage is ultimately decided by customers," Griffin says. And what customers value most right now is "retailers who respect their time and save them money," he says.

Tom Friedman, publisher of *Retail Systems Alert* and an influential voice in the industry, goes even further. "There's no competitive edge whatsoever in flashy, consumer-oriented technology," he says.

Perhaps so. When Builders Square recently installed PC-based kiosks near its store exits, managers at the San Antonio-based home center chain thought they had developed a novel way to gather customer feedback. Too bad the systems gathered mostly dust.

The reaction of many shoppers is summed up by Albert Clark, president of the American Homeowners Association in Washington: "Who wants to type comments into a computer when you've got a shopping cart full of supplies and a project waiting for you at home?"

The Builders Square project failed. And it's typical of early service-oriented technology efforts in the home center retail industry. ■

Early customer-focused technology efforts have had disappointing results

While there's a desire among many retailers to use more customer-focused technology, early efforts have shown that more doesn't always mean better.

One aspect of service that frustrates many home center shoppers is special orders. Despite ample inventories, these stores sell a lot of products this way, especially big-ticket items such as kitchen cabinets, doors and windows. Typically, consumers write up an order by hand, gathering parts numbers and prices from a catalog. A salesperson then reviews the order, and the store sends it to the manufacturer.

"There's all kinds of room for error because so many people get involved in the process," says Rod Albertus, a store manager at the Ernst Home Centers chain in Seattle.

Indeed, nearly 70% of special orders have mistakes, according to A. C. Thomason, president of Intermedia Systems, Inc., a Lexington, Ky., developer of interactive selling systems.

Part of the problem is the increasing number of products and the complexity of special orders, says Scott Larson, senior editor at *National Home Center News*, a New York-based trade journal. Couple that with high employee turnover rates typical of the retail industry, and you've got a training nightmare.

To whittle that number down and attract new business, Ernst rolled out Direct Source, a kiosk-based ordering system, last February in its 95 stores throughout the Northwest. According to Tom English, Ernst's vice president of IS and CIO, the touch-screen kiosks offer 45,000 items, from doors to dog kennels.

The kiosks cost \$10,000 each and have an Intel Corp. Pentium-based PC, a CD-ROM drive, a 3G-byte hard disk and custom software from Intermedia Systems. Connected via a frame-relay network to the corporate wide-area network in Seattle, the kiosks are updated regularly with price and stock information.

English wouldn't say how many orders the retailer has received so far from Direct Source. "It isn't quite up to our expectations, but we still consider it a successful rollout," he says. ■

An IS service opportunity awaits

Giant home centers may soon be forced to supplement their people-dependent service strategy with information systems. Inventory management is the bedrock of good service, and customers expect chains to have the products they want at low prices. Fail to deliver, and you can't play the game.

But IS chiefs such as Pete Olle see an opportunity for technology at home centers to move beyond inventory systems. "Now that we've got our transaction systems solid, we can start going after customer service," says Olle, CIO at Hechinger Stores, a Landover, Md.-based chain that operates 66 stores as well as 50 Home Quarters Warehouse stores in 21 states.

Olle says his company is developing several customer-oriented applications. He won't elaborate on them for competitive reasons, but says all are aimed at "making the customer's experience more enjoyable."

Richard Nawrot, senior vice president of IS at Payless Cashways in Kansas City, Mo., says his chain's information-intensive service efforts might also benefit from technology.

"A large part of our business is moving information about goods and services prior to the sale, but we haven't really explored how we can use [information technology] to deliver new levels of service to the customer," Nawrot says.

Now that nearly every chain has mastered tasks such as automatic stock replenishment, the home center industry has effectively raised the bar on itself, Nawrot says. "The new challenge will be to know not just what we sold, but who we sold it to and to influence consumer behavior," he says.

Payless and other home centers are evaluating data warehouses and other customer information systems to improve promotion efforts and service. Mike Bergman, director of MIS at Grossman's, Inc. in Braintree, Mass., says such technology can enable even behemoth centers to replicate the familiar relationships local hardware store owners have with customers.

Steve Biciochi, a principal at CSC Consulting's national retail practice in Cleveland, applauds that approach. "Customers are becoming increasingly finicky and want things done their way," Biciochi says. "I think the home center segment must build its capability to meet individual needs in a mass way."

IS will play a crucial role in delivering such mass customization, Biciochi says. The big chains spend more than \$100 million on IS each year. "I tell them to allocate a couple million to explore what kind of architecture they'd need to deliver individualized service. This stuff goes fast when it happens," he says. ■

McWilliams is a freelance writer in Durham, N.H.



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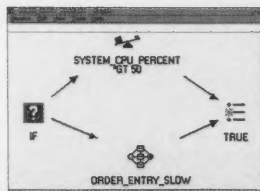
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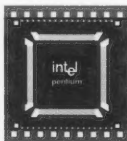
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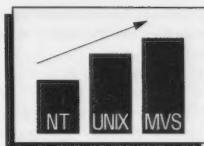
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Interview

MindMeld

Forget restructuring. In his new book, General Motors' IS chief says new technology-based ways of shared decision-making will make organizations really hum.

By Joseph Maglitta

Still doubt that the old hierarchical, adversarial, gut-driven way of making decisions is a one-lane highway to corporate and professional hell? Then listen to this woeful tale told by General Motors Corp. information systems veteran Vincent Barabba:

In 1978, internal politics and misread customer research killed a GM minivan prototype. (Astoundingly, Ford Motor Co. also made the same mistake). Too bad, because six years later Chrysler Corp. introduced the hot-selling Dodge Caravan. This botched decision cost GM and Ford billions in sales.

That's the most dramatic — but hardly the only — such example in Barabba's new book, *Meeting of the Minds* (Harvard Business School Publishing, \$27.95, (800) 545-7685), which arrives in bookstores today. The moral: Companies must tune all ears to the market's voice, commit to a common purpose and develop processes and software tools that promote systematic knowledge-gathering and decision-making. Those that fail to do that, he warns, face certain stagnation — or worse.

Computerworld recently spoke with Barabba, a 30-year IS and marketing executive and general manager of GM's Strategic Decision Center in Warren, Mich.

CW: What's the payoff idea for IS managers and professionals in all this?

Barabba: Your job is not just the [information technology] job. Ask, "How does what I do fit into the broader picture in the enterprise?" If you look at things that way, you could ask yourself a lot of questions about how to do your job a lot better.

CW: How does your parallel approach to making decisions differ from old, serial ways?

Barabba: The simultaneous approach says... even though the concept implementers aren't doing anything in the beginning, they're part of the dialogue with concept generators. They can start thinking about things and give feedback, saying, "That's going to be really hard to make" or "It's not going to last as long."

[All] are interacting with the voice of the market. Out of that you get a shared vision. The obvious value is in the time saved. It's also in the richness of the dialogue.

CW: Can you give an IS example?

Barabba: In the systems group, the guys who write code say, "Give me the specs." You say, "I'm not quite sure that I got my idea right yet, but I want you to start thinking about how to do it." They say,

"I'm not going to start anything 'til you tell me what the outcome is supposed to look like."

They may have ideas in implementation that would make the idea even better. But if they won't start 'til I finish my specs, we lose a lot of capability. The ability of the downstream group to be flexible, to live with ambiguity, is key.



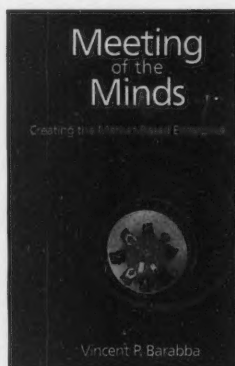
Vincent Barabba

CW: You also exhort managers to look outside their "silo" for solutions to problems...

Barabba: You come to me and say, "I've got a systems problem." What am I going to do? I'm going to give you a systems solution. But maybe it wasn't a systems problem. Maybe it was a process problem. Maybe it was an external business problem. Maybe it was a customer problem. You've also got to make sure that your customers get out of the silo.

What if I said, "What makes you think it's a systems problem? Let's poke at that a bit." We would make sure that we agreed what the problem is, that we understand it very, very well. We would look at alternative solutions—including that it's not a systems problem.

We can then say all, or any one, of these alternatives are pretty good. Then we ask if we can come up with something even better by combining the val-



ue in each of them. In our experience, you always do.

CW: Will adopting this corporate decision style benefit me if I'm a database manager, for example?

Barabba: Definitely. What's the biggest problem right now for people who want to create a data warehouse? Getting everyone who owns the data to agree on the definitions. You go to them and say, "You're going to have to change the number of digits you have in your product description." The data owners say, "You know how much that's going to cost us?"

If you get that kind of mind-set, the likelihood of creating a cross-enterprise data warehouse is very low. But if we have a common process, we will go through the same process every time and use the same data set.

CW: But as a database manager, it's unlikely I'd have the clout to force this process standardization.

Barabba: If your boss was the [chief information officer], I'd go find him and say, "We really ought to go to work on this kind of stuff." Maybe even the CIO can't do it. But you ask, "If we went at it together, who in the company would work on a team to cause this to happen?" Maybe you've got to get a counterpart in some other function and say, "Let's go talk to the boss."

CW: Does this kind of shared decision-making require any kinds of new systems or technology?

Barabba: There's more technological capability out there than we're using. A lot of the new stuff is going to be in groupware. As we create objects, the infrastructure will get fatter and the applications thinner.

CW: Does this relate to re-engineering?

Barabba: Re-engineering often results in restructuring. Everybody is going to worry about who they're going to report to next. It can get really... demoralizing.

Changing the decision-making process is a form of re-engineering. When you get the enterprise process model in place, it really doesn't matter who you report to. If you want to change the culture, go right to the decision process.

Maglitta is *Computerworld's* senior editor, corporate strategies.



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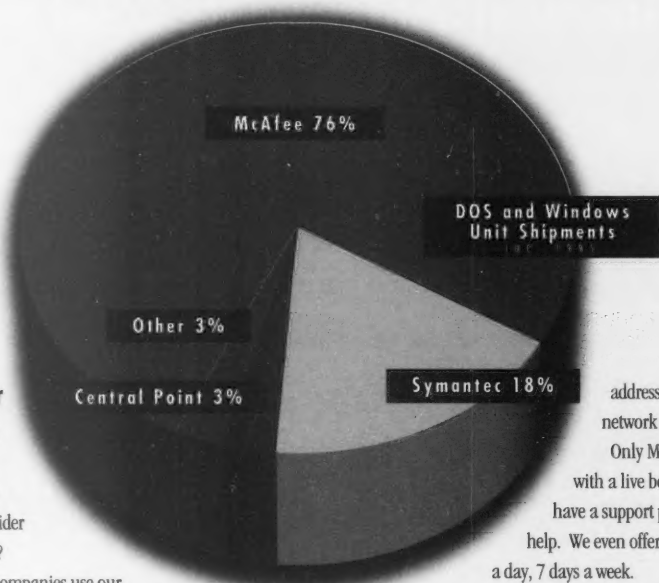
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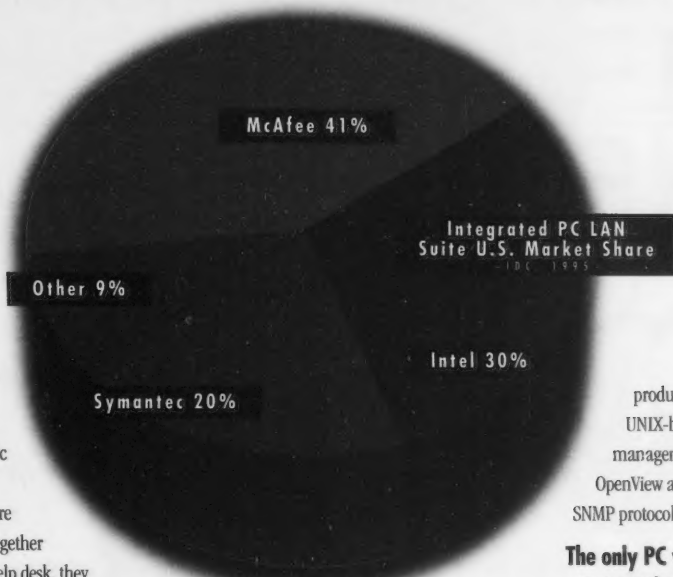
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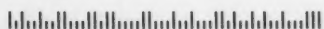
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 - 40. Wholesale/Retail/Trade
 - 50. Business Service (except DP)
 - 60. Government - State/Federal/Local
 - 65. Communications Systems/Public Utilities/Transportation
 - 70. Mining/Construction/Petroleum/Refining/Agric.
 - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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 - 95. Other _____
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 - IS/MIS/DP Management
 - 21. Dir./Mgr. MIS Services, Information Center
 - 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr., IPC Mgr., Tech Planning, Admin Sys.
 - 23. Dir./Mgr. Sys. Development, Sys. Architecture
 - 31. Programming Management, Software Developers
 - 41. Engineering, Scientific, R&D, Tech. Mgt.
 - 60. Sys. Integrators/VARs/Consulting Mgt.
 - CORPORATE MANAGEMENT**
 - 11. President, Owner/Partner, General Mgr.
 - 12. Vice President, Asst. VP
 - 13. Treasurer, Controller, Financial Officer
- DEPARTMENTAL MANAGEMENT**
 - 51. Sales & Mktg. Management
 - 70. Medical, Legal, Accounting Mgt.
- OTHER PROFESSIONAL MANAGEMENT**
 - 80. Information Centers/Libraries, Educators, Journalists, Students
 - 90. Other Titled Personnel
3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems	(e) Mac OS
(a) Solaris	(f) Windows NT
(b) Netware	(g) Windows
(c) OS/2	(h) NextStep
(d) Unix	<input type="checkbox"/> Yes <input type="checkbox"/> No
App. Development Products	<input type="checkbox"/> Yes <input type="checkbox"/> No
Networking Products	<input type="checkbox"/> Yes <input type="checkbox"/> No

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 - 65. Communications Systems/Public Utilities/Transportation
 - 70. Mining/Construction/Petroleum/Refining/Agric.
 - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
 - 90. Computer/Peripheral Dealer/Dist./Retailer
 - 95. Other _____
2. **TITLE/FUNCTION** (Circle one)
 - IS/MIS/DP MANAGEMENT**
 - 19. Chief Information Officer/Vice President/ Asst. VP
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App. Development Products	<input type="checkbox"/> Yes <input type="checkbox"/> No
Networking Products	<input type="checkbox"/> Yes <input type="checkbox"/> No

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MANAGEMENT

Making Your Sales Process a Strategic Competitive Advantage. Dallas, Nov. 9. — Topics include: the business case for sales force automation, methodology for business process analysis and development, and generating competitive advantage through contract management. Contact: CPI, Dallas, Texas (800) 622-4786, ext. 46349.

Joint Application Development (JAD) Facilitation and Implementation Seminar Using Object-Oriented Software Engineering. Stamford, Conn., Nov. 13-15. — Focus is on how to manage and facilitate JAD projects. The workshop provides training in facilitation techniques needed to capture the deliverables for the object-oriented application development life cycle using Rumbaugh and Jacobson methods. Fee: \$1,475. Contact: Pierson Applications Development, Inc., Stamford, Conn. (203) 322-1606.

Market-Driven Product Definition. Cleveland, Nov. 14. — Topics include: what customers want, how marketers and engineers can agree on customers needs, the prerequisites to successful product definition and creating the right product at the right time. Also offered Dec. 14 in San Diego. Contact: Registrar, Management Roundtable, Inc., Waltham, Mass. (800) 338-2223.

IT Services '95 Conference & Showcase. Washington, Nov. 15-17. — Theme: "Professional Services in Multivendor Environments." Topics include: covering services issues, outsourcing, systems and network integration, consulting and re-engineering. Fees: two-day conference, \$795 (government, \$595); one day, \$495 (government, \$395). Contact: Creative Expos and Conferences, Inc., Walpole, Mass. (508) 680-7099.

Electronic E-Cash. San Francisco, Nov. 16-17. — Theme: "Commercial Opportunities. Technological Innovations. Security Implications." Topics include: forces that shape the electronic commerce market, real-world and government policy implications, evaluating the demand uses and service opportunities available. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Business/Disaster Recovery. Atlanta, Nov. 29-30. — Topics include: preparing for business recovery, the plan itself, dealing with the unexpected, recovering PC LANs, dealing with employee stress and assuring a successful aftermath. Contact: Lynn Ganim, LOMA, Atlanta, Ga. (770) 984-6459.

Interactive Learning Technologies Conference. Washington, Nov. 29-30. — Focus is on helping to maximize the training dollars of corporate training and development professionals who use interactive technology. Contact: Spectrum Human Resource Systems Corp., Denver, Colo. (303) 534-8813.

Tools & Technology for Self-Directed Learning. Scottsdale, Ariz., Nov. 27-30. — Theme: "Innovative, Interactive Training Systems for Boosting Employee Performance." Topics include: self-directed learning and teams, self-managed learning and multimedia/computer-based learning. Contact: International Quality & Productivity Center, Little Falls, N.J. (201) 256-0211.

INDUSTRIES

Data Warehousing Strategies for Insurance Companies. New York, Nov. 8-10. — Topics include: developing a flexible central repository, structuring the data so it is easily available to decision-makers, keeping data accurate through regular "cleaning" and maintenance of the warehouse. Contact: Global Business Research Ltd., New York, N.Y. (212) 645-4226, ext. 3006.

Council for Electronic Revenue Communication Advancement — Fall Membership Conference. Arlington, Va., Nov. 9-10. — This conference will update electronic revenue communications stakeholders on the latest advancements in the field. Included are updates by the IRS and other government department officials and industry leaders. Contact: Lisa Karmen, Council for Electronic Revenue Communication Advancement, Chicago, Ill. (312) 644-6610.

Comtrade: The Global Event for Computers and Communications in Health Care. Atlanta, Nov. 15-18. — Topics include: computers and communications in health care, computer hardware and software systems, communications networking, electronic bar coding and data interchange. Contact: PAN Communications, Andover, Mass. (508) 474-0055.

Cause '95. New Orleans, Nov. 28-Dec. 1. — For information systems professionals in education. Topics include: extending legacy applications to the new enterprise architecture, client/server architecture for mainstream administrative systems and sustaining and supporting mainstream use of instructional technology. Fees: Cause members, \$430; nonmembers, \$630. Contact: Cause Professional Development, Boulder, Colo. (303) 939-0315.

USER GROUPS

Teleforum. San Diego, Nov. 30-Dec. 1. — Focus is on giving resellers information and training to develop mission-critical applications using Teleform. Cardiff Software, Inc.'s forms processing software. Contact: Cardiff Software, Carlsbad, Calif. (619) 931-4500.

TECHNOLOGIES

The Third Color Imaging Conference. Scottsdale, Ariz., Nov. 7-10. — Focus will be on creation, transmission, reproduction and display of color images, both traditional and digital. Jointly sponsored by the Society for Information Display and the Society for Image Science & Technology. Contact: Pam Forness, Society for Image Science & Technology, Springfield, Va. (703) 642-9090.

Autofact '95. Chicago, Nov. 12-16. — One of the top annual expositions on manufacturing systems, Autofact targets design engineers, process engineers, systems integrators and managers. Contact: Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Advanced Marketing Strategies for the Internet & Other On-line Services. Boston, Nov. 13-15. — Topics include: creating a World Wide Web site

that ensures usage and exposure, developing the appropriate infrastructure, brand management in the Electronic Age, promotion and event marketing and performance measurement. Fee: \$1,295. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Comdex/Fall '95. Las Vegas, Nov. 13-17. — Topics include: management strategies, business on the Internet, multimedia, distributed computing, the changing desktop, wireless and mobile computing, technology fundamentals, business process re-engineering and outsourcing. Contact: Softbanks Comdex, Inc., Needham, Mass. (617) 449-6600.

Power Testers. Orlando, Fla., Nov. 13-17. — Focus is on ways people are solving tough testing problems and concentrating on practice. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Re-engineering Cellular: For the New Competitive Reality. Washington, Nov. 14-15. — Topics include: capturing the mass consumer market, beating your competitors, personal communications services and the other cellular incumbent, technical solutions for reducing capital costs, next-generation billing and customer care systems. Fee: \$985. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Field & Sales Force Automation. Boston, Nov. 28-30. — Keynotes: "Virtual Selling" by Tom Siebel, president and chief executive officer of Siebel Systems, Inc.; "Delivering the Promise of Personal Communications Services" by Jai Bhagat, president and CEO of Skytel; and "The Wireless Transformation" by Ken Arneson, vice president

of business development at AT&T Wireless. Fees: Sales Automation Association member, \$509; nonmembers, \$729. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Call Center Tech '95. Las Vegas, Nov. 29-Dec. 1. — Theme: "Gaining a Competitive Edge Through the Deployment of Customer-focused Technology." Topics include: computer telephone integration, voice and data desktop products, interactive voice response, automatic number identification and knowledge-based systems. Fee: \$1,195. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Faxworld '95. San Francisco, Nov. 29-Dec. 1. — Focus is on helping information systems and communications professionals who are using or implementing fax-integrated messaging technologies in their organizations. Keynotes by Chris Roeckl, executive editor of *Communications Week*, on "A Vision of an Integrated Communications Strategy" and Mark Skapinker, president of Delrina Corp., on "The Future of Fax Software." Fee: \$895. Contact: Customer Service at BIS Strategic Decisions, Norwell, Mass. (800) 874-9980.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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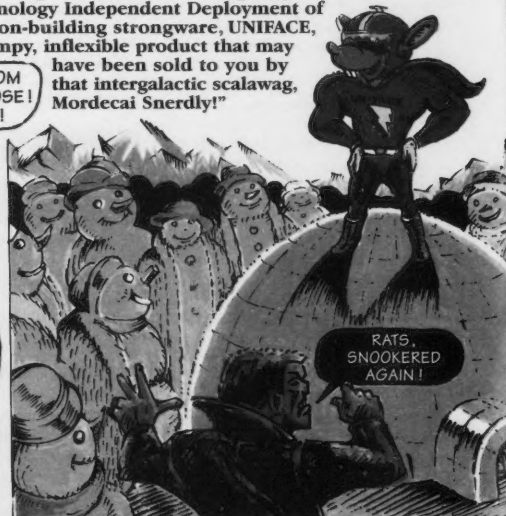


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...our mighty warrior is greeted by a babble of voices crying for help to free them from legacy technologies.

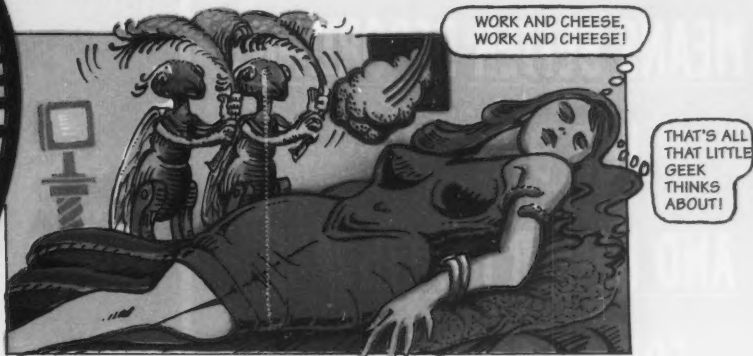


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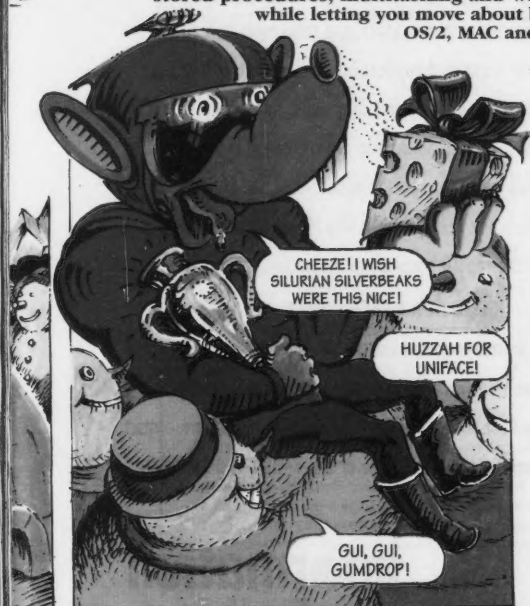
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*James Wells, VP and CIO
Magee-Womens Hospital
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In Depth

SO WHAT'S ALL THIS ABOUT... WORKFLOW?

BOMBARDED WITH QUESTIONS BY MANAGEMENT, BAMBOOZLED BY SUPPLIERS, YOU NEED TO COME TO THE TABLE KNOWING WHAT WORKFLOW CAN DO FOR YOU TODAY — AND WHERE IT'S GOING

WORKFLOW DEFINED

Workflow software automates and tracks the flow of documents and work processes through a company. The focus is on how work normally moves through an organization — the process — instead of on the specific information. There is a consensus today that you can break workflow products down into four groupings:

Production workflow:

Deals with transaction-oriented, high-value, repetitive processes such as insurance claims or accounts payable. Representative vendors include IBM, FileNet Corp., Wang Laboratories, Inc., BancTec, Inc. (formerly Recognition International), ViewStar Corp., Unisys Corp., AT&T Global Information Solutions, Staffware Corp., Xsoft and IA Corp. Average 1994 price: \$1,050/seat*.

Collaborative workflow:

Deals with high-value, nonrepetitive, generally nontransaction-oriented processes such as new product development, sales force automation or technical document assembly. Representative vendors include Xsoft, Action Technologies, Inc., Digital Equipment Corp., FileNet, Documentum, Inc., Keyfile Corp., Intergraph Corp. and Novasoft Systems, Inc. Average 1994 price: \$500/seat*.

Administrative workflow:

Deals with low-value processes generally connected to routine office work such as travel expense reporting, budgeting and purchase approvals. Essentially electronic-mail forms. Representative vendors include Reach Software Corp., Delrina Corp., WordPerfect, Microsoft Corp., Jetform Corp. and Banyan Systems, Inc. Average 1994 price: \$113/seat*.

Ad hoc workflow:

Deals with low-value processes generally connected to routine office work such as FYI routing, review and approval. Lots of ad hoc products are E-mail-based and workflow software is beginning to be offered as a feature function in messaging products. Representative vendors include Lotus Development Corp., Keyfile, Microsoft and WordPerfect. Average 1994 price: \$180/seat*.

*Pricing for stand-alone workflow software products comes from BIS Strategic Decisions



By AMY MALLOY, LAURA HUNT AND LORY DIX

What questions must potential buyers ask workflow vendors?

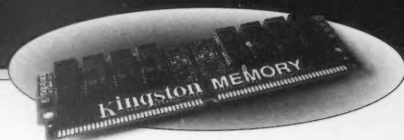
- What are your plans for cross-platform support?
- How can your workflow product be integrated with groupware?
— Connie Moore, director of workflow, document and imaging strategies, BIS Strategic Decisions, Norwell, Mass.
- Do you support multiple servers?
- Do you have a process mapping interface that graphically illustrates the workflow process?
- Do you use an open database repository to store all rules, routing instructions and workflow definitions? By "open database" I mean industry-accepted technologies such as databases from Oracle Corp., Sybase, Inc. or Informix Software, Inc.
- Do you have the ability to capture and report on runtime statistics such as when every task begins, how much time elapses between tasks, what the workload is for every individual in the work process and what the throughput and transaction volume is? I want to use the information about how the workflow is being executed to modify and enhance operations and processes.
— Thomas M. Koulopoulos, president, Delphi Consulting Group, Inc., Boston
- How do I get my people to use workflow?
- How can I keep my processes growing and up to date without a lot of redevelopment?
— Ronni Marshak, senior analyst, Patricia Seybold Group, Boston

Workflow, page 97

MAYBE YOU DON'T
NEED MORE PEOPLE.

MAYBE YOU DON'T
NEED MORE TIME.

MAYBE YOU JUST
NEED MORE MEMORY.



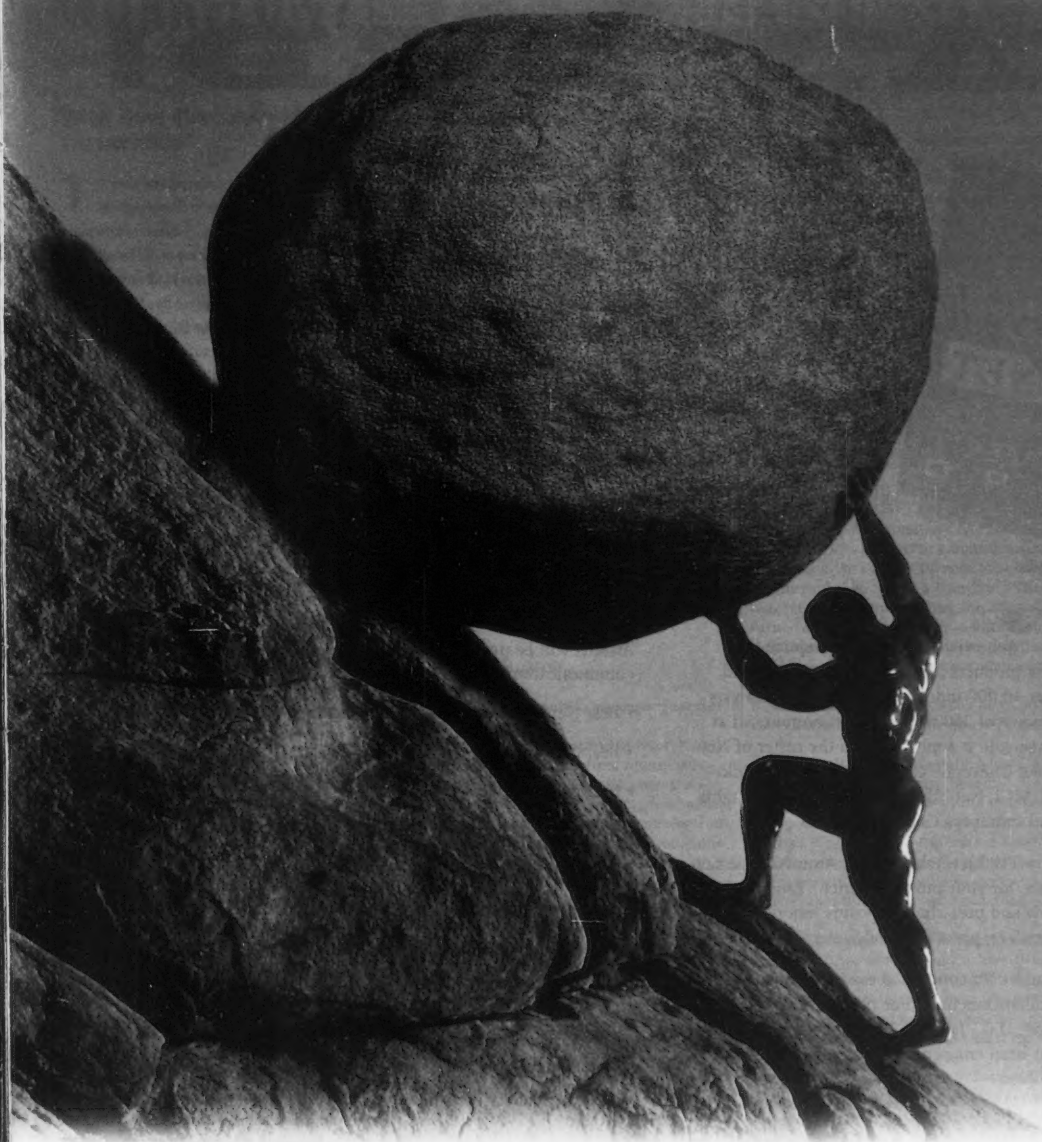
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SO WHAT'S ALL THIS ABOUT... WORKFLOW?

CONTINUED FROM PAGE 93

What does the future hold for workflow?

There is an emerging market for workflow as middleware embedded in all kinds of computer systems.

In the future, users will buy workflow as part of a bigger suite of software, and they will look at the overall software package rather than workflow by itself. It's happening right now; application software companies such as SAP America, Inc. and PeopleSoft, Inc. are putting workflow (tools) into their product offerings. Some of the document management products are workflow-enabled now.

Workflow is getting caught up with business process re-engineering, and one of the things that will be happening is business process re-engineering tools will be more closely integrated with workflow.

—Connie Moore

It's absolutely clear that workflow will be embedded as part of an overall business operating system within five years. It's beginning to happen. Microsoft is working with Keyfile to incorporate the Keyfile engine with its Exchange product. Microsoft is also working with Wang. Novell, Inc. is working with FileNet on an upcoming product suite called Ensemble, which incorporates some very basic FileNet workflow technology.

Also, as desktops become more and more object-oriented, some of these objects will take on a knowledge-based component — we call it workflow. The general functionality of taking rules and bundling them with an information object, I think, is absolutely a trend. We'll see it on the desktop in about five years.

On the information systems skills side, workflow will demand people who have a greater understanding and appreciation for object orientation and object-oriented standards such as CORBA [the Object Management Group's Common Object Request Broker Architecture] and OpenDoc. A lot of the more advanced workflow tools are heavy object-oriented.

IS will also need to know business analysis. IS people will have to go in and work with the end-user organizations directly. These analysts won't just gather requirements, but they will help the end-user organization better understand the process and start making some serious changes to the process if needed.

—Thomas M. Kouloupoulos

WHAT USERS SAY

ROSS BOULET

Vice president of management
Management Consulting Corp.
Texas Commerce Bank
Houston

Uses workflow for consumer loan back-office processing. Loan gets faxed into the image system directly and ViewStar software automates the processing of the application through to the creation of a customer loan contract.

RICHARD KESNER

Chief information officer
Babson College
Wellesley, Mass.

Uses workflow for admissions, inquiry calls, transferring credit evaluations and purchasing and reimbursements. For example, when someone requests a purchase order, it gets processed through the purchasing system and either gets forwarded for approval or sent to a purchasing department processor. That person either accepts the order, forwards it for change or rejects it. The Action workflow engine tracks that activity.



BRETT WALLIS

Lead systems analyst
Integron Corp.
Nonstandard automobile insurance carrier
Winston-Salem, N.C.

Uses workflow for claims processing. FileNet software follows the claim from when it is received through to the claims adjuster. Also for controlling digitized mail through the company, with client software generating some electronic documents that are then routed throughout the company.

FRANK MANCI

Document imaging
coordinator
Colonial Savings
Fort Worth, Texas

Uses ViewStar workflow product to manage and track the mortgage loan process. Colonial scans 40,000 loan pages a day.



WHAT IMPROVEMENTS WOULD YOU LIKE TO SEE IN WORKFLOW SOFTWARE?

WALLIS: I would like the "superuser" to be able to control work a little more dynamically from the client end. My impression right now of workflow is that it is still mainly in the control of the systems area — programmers and application developers. There are some tools that make it easier for the superuser to move work around from place to place, but I don't think it has evolved to quite the wonderful graphical user interface everybody thinks it is. I would just like to see things become more open.

MANCI: Workflow software vendors need to open up to front-end customization via tools such as Microsoft's Visual Basic, Powersoft's PowerBuilder and Borland International's Delphi.

KESNER: I think products lack user front ends, and we have to develop those ourselves at great expense. I would like graphic representations of workflow status — things that are user-friendly and graphically oriented so our customers can use the tool without our intervention.

WHAT TIPS DO YOU HAVE FOR YOUR COLLEAGUES?

MANCI: If a vendor promises it can handle your production volume, make sure you see its product in a similar environment handling that level of production. We said, "We'll need to do 40,000 pages a day," and sales people said, "We do that all the time." They give you references, and the biggest one ends up handling only 800 pages a day. With several firms, it turned out that their product could not physically handle the job. Take a lot of time [on your decision] because it's a lot of money. We called other mortgage companies to find out what universe of vendors they used.

BOULET: Don't automate existing [manual] workflow; re-engineer the process first and then apply the workflow technology.

WALLIS: Don't trust the vendors. A lot of them are promising things that are not even on the drawing board.

Instead, build expertise within your own organization, and let your own people design and build your workflow. Don't rely on vendors' "expertise," [especially in application development], which in many cases is not as robust as they would like you to think. It's worth the extra bucks to train somebody on your own staff.

The other thing is to read, read, read.

KESNER: Beware of the cost. Workflow is deceptive; it's more expensive than you think. You are going to have to invest in the database engine. For a truly comprehensive workflow-enabled system, you are going to have to buy seats for every user, which can be very expensive.

Don't underestimate the complexity with software interaction. Without a database dictionary and fairly rigorous control of nomenclature, you are going to be in trouble.

Lastly, you've got to get your IS people to think in very different ways. Users grasp this whole process very easily because it is all process-based, but it is very difficult for programmers who have grown up in a Cobol or AS/400 environment.

RESOURCES

ON-LINE

- <http://www.is.cs.utwente.nl:8080/~joosten/workflow.html#whoswho>. Listing of who's who in workflow research and links to key workflow sites on the World Wide Web.
- <http://planet.com/workmedia/wt/html>. On-line workflow journal.

CONFERENCES

- BIS Business Process & Workflow Conference 1996. Feb. 4-7, 1996. Lake Buena Vista, Fla. (617) 982-9500.

- Seybold Seminars (workflow automation). Feb. 27-March 1, 1996. Boston. Contact: Erin Gaffaney (415) 578-6947.

- Association for Information and Image Management show and conference. March 31-April 3, 1996. McCormick Place, Chicago (800) 447-2446.
- Groupware 96/Workflow 96. The Conference Group. May 12-17, 1996. Chicago (602) 443-4090.

GROUPS AND ASSOCIATIONS

- Workflow and Re-engineering International Association. Lighthouse Point, Fla. (305) 782-3376.

- Workflow Management Coalition. Brussels (011-32) 2774 9633.

OTHER

- "Workflow Buyer's Guide" and "The Workflow CD-ROM Sampler." Creative Networks (608) 832-6647.
- Workflow market report and monthly newsletter. Delphi Consulting Group, Inc. (617) 247-1025.

Malloy is assistant research, Hunt is research analyst and Dix is a senior editor at Computerworld.

Senior writer Tim Ouellette also contributed to this report.

11:30^{PM}

Firm's working late on big project.
Network's humming along.

11:31^{PM}

Weird sounds from printer
interrupt your bliss.

GRRRUNK GRRRUNK

11:32^{PM}

Realize you never learned those words
in fourth-year French.

11:33^{PM}

But you have IBM printers. You get IBM service.

11:59^{PM}

They translate over the phone. Printer's saying,
"Refresh my memory."

12:07^{AM}

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Computer Careers

Going it alone can pay off

By Alan Radding

These are good times to be an independent contractor.

"There are more jobs out there, and rates are going up," crows Bob Avallone, principal at MetaPro Systems, Inc., a consultancy in Medford, Mass.

The trends toward downsizing, outsourcing and virtual teams are opening doors for savvy independent contractors. But opportunity alone doesn't make life easy for these computer professionals. Contractors face constant challenges in marketing, pricing their services and keeping their skills current.

"For technical people, the hardest part is—and always has been—marketing," Avallone says. "It just doesn't come naturally."

Marketing encompasses more than simply selling your services. It includes handling customer relations, planning ahead and anticipating the skills and services your customers will want down the road.

Timing is critical. "It's feast or famine. The trick is to premarket yourself before your current job ends," says Henry

Blake, a C++ programmer in Mesa, Ariz. Successful contractors perform a balancing act, completing the work they have while putting out feelers for their next project.

Many contractors say they can avoid the marketing problem by using temporary employment agencies, popularly known as body shops. These companies handle the initial client solicitation and perform billing and payment, taking a percentage of the contractor's fee for themselves (typically 20% to 25%). But this approach isn't foolproof.

"Now you're dependent on the body shop's ability to find work and negotiate fees," says Brian Camenker, an independent contractor in Newton, Mass., who has gotten about two-thirds of his work through agencies in the past.

In fact, most body shops don't sell the services of individual contractors. They ship a stack of resumes to the client, who picks those that seem the best fit and calls those candidates for interviews. "You still end up having to sell yourself," Camenker says. He advises contractors to have their own set of contacts.

The Independent Computer Consultants Association (ICCA) in St. Louis is

one place to look for help. For example, local chapters provide a forum for networking among contractors in a given area. Recently, the ICCA opened a World Wide Web page (<http://www.icca.org>) that lists members and their specialties.

Name your price

Another tricky aspect of marketing is setting your rates. "The thing I found hardest is pricing," recalls Mark Radding, who took a full-time job as senior systems manager at Shareholder Services Group in Boston after seven years as an independent contractor.

Each job and client is different, Radding explains, and he found it impossible to maintain a standard price schedule.

At times, he says, he was forced to take a job at a lower rate than it was worth just to stay busy. Ultimately, "you make more money as an independent contractor," Radding says, but the stability is missing.

Camenker says he's found that clients like fixed-priced jobs. He estimates the hours involved, calculates a price based on a good hourly rate and adds in enough hours to cover contingencies. All that, and the client still gets the project done for less than if it did the job in-house, he says.

Keeping skills current is another challenge for contractors, especially when technology changes rapidly.

"I invest a lot in books and

how-to materials," says Jim McKinniss, who runs JM Consulting in Redondo Beach, Calif. A contractor since 1982, McKinniss keeps tabs on emerging technologies through magazines before he invests in those that seem most promising. He identified Microsoft Corp.'s Visual FoxPro as his next hot technology, purchased the software, signed up for training and recently started his first Visual FoxPro project for a client.

The bottom line: Successful independent contractors think of their careers as businesses that must be managed, and they are the managers as well as the workers.

Radding is a freelance writer in Newton, Mass.

Independent contractor marketing in a nutshell

Build a network of people who can steer work toward you—including other programmers, vendors, people on the client side.

Develop several specialties.

Put out feelers for new work before you complete your current contract.

Develop contacts outside of employment agencies.

Understand your cost structure and develop a flexible pricing mechanism that works for you and your customers.

Identify emerging technologies of importance to your customers.

Invest in developing your skills.

Join professional associations such as the ICCA.

Think of your independent contracting career as a business to be managed.

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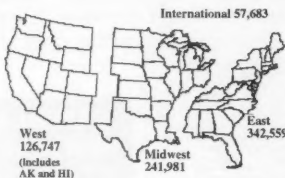
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Notes 4.0 may send you back to class

Developers may like tools in latest release but face a learning curve

By Leslie Goff

The addition of an object-oriented scripting language and new user interface design options to Lotus Development Corp.'s latest Notes release will give developers greater flexibility and creativity in designing Notes applications. But developers certified in Release 3.30 should expect to climb a significant learning curve.

Notes Release 4.0 will be out later this year or in January, according to analysts. The differences between Releases 4.0 and 3.30 will be far greater than those between Releases 3.0 and 2.0.

LotusScript, an object-oriented programming language that many analysts compare to Microsoft Corp.'s Visual Basic application development tool, is being ported across Lotus' entire software suite.

Release 3.30 uses a macro language based on formulas and @ functions. Complex applications require developers to write to Notes application programming interfaces (API). "Instead of having a kludgy macro language, developers will have a much more powerful scripting language" with Release 4.0, says Matthew Cain, vice president of Workgroup Computing Strategies Service at Meta Group, Inc. in Stamford, Conn. "The Notes APIs have been encapsulated into a series of objects, so instead of writing to the APIs, you can write to higher-level objects."

Release 4.0 also will provide developers with a more diversified tool set and

user interface options, Cain says. Agent-based technology, for instance, will let developers write applications that alert end users when information of particular interest to them is added to a specified database.

Notes Navigator will make it possible to give users graphical representations of information, such as sales by region. Prior Notes releases could present information only in text format. Encapsulated database calls will make it easier for developers to give users access to outside databases.

"In some programming environments, the user interface is self-defined, so the developer doesn't have any control over the interface," says Ken Lownie, presi-

dent of Connexus Consulting Group in Andover, Mass. With Notes Release 2.0, users had forms and views. Release 3.0 added tools such as button capability, pop-ups and the ability to do internal and external look-ups.

"It will make it more challenging to be a good Notes developer because choosing the right tools and the right interface for an application will be even more of an art than it is today," Lownie says. "With Release 4.0, Notes becomes a richer environment, and as with any design challenge, the solution isn't to use all the tools but to use the right tools."

Lownie compares using the programming environment of Release 4.0 to the design capabilities of desktop publish-

ing. "In the hands of a bad designer, desktop publishing tools still don't work well. The more tools you have, the greater sense of an aesthetic you need," he says.

Lotus Authorized Education Centers will offer several courses for certified Release 3.0 application developers, and a few new Release 4.0 courses, when Notes 4.0 is first delivered to customers, says Terri Purinton, marketing manager at Lotus Education in North Reading, Mass. She can't confirm exactly when Release 4.0 will ship.

A general Applications Development Seminar will show developers how to convert a Release 3.0 application to Release 4.0 and add Release 4.0 functionality, Purinton says. Other seminars will cover the fundamentals of programming syntax, object-oriented programming topics and advanced application development using LotusScript. A complete list of Release 4.0 classes will be available in December. Self-paced, computer-based coursework also will be available.

In the meantime, Notes consultants say application developers who aren't already familiar with LotusScript or Visual Basic should start familiarizing themselves with both environments. "If you are a Visual Basic programmer, you have a huge head start on LotusScript," Lownie says.

"Notes 4.0 isn't going to change our jobs, but rather the tools we have to do the job," says Jack Rathmell, president of Collaborative Systems, Inc. in Cambridge, Mass.

Goff is a freelance writer in New York.

OF NOTE FOR ADMINISTRATORS

Among Notes Release 4.0's biggest selling features are streamlined administration and centralized management of the Notes environment, which includes the following features:

- **Administrative Control Panel**, a single graphical interface to manage users and groups, view message logs and manage several servers simultaneously.
- **Delegated Administration**, which centralizes Notes policy-making and control while assigning administration privileges or roles to groups of administrators.
- **Server Configuration Record**, which allows administrators to make changes to network servers regardless of geographic location.
- **Server Console Panel**, a single graphical interface that consolidates administration information and activities.
- **N&A and ACL Management Tool**, which automates the administration process for renaming and deleting users.

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Software Development Manager: Will be responsible for developing TRITON manufacturing control system & business application modules for the North American market. Will supervise teams of programmers, systems analysts, & software engineers, & directly participate in Development Department's efforts to investigate client & North American environment system req's, to design manufacturing/enterprise control system in accord with req's, to modify or write new code for TRITON system, & test North American TRITON system & business applications/modifications as core duties. Will review, modify, & improve work completed by programmers, systems analysts, & software engineers, where necessary. Will act as expert support for International Service Center with general responsibilities including product planning, design, development, documentation, maintenance, & support. Bachelor of Science in Computer Science/Computer Technology req'd. Must have a min of 5 yrs' exp. as software development manager or 5 yrs' exp. as programmer & systems analyst. Must have min of 4 yrs' exp. in design & development of manufacturing/enterprise control & related applications, including min of 1 yrs' exp. with TRITON or Manmark families of manufacturing/enterprise control systems. Must be able to program using 4GL relational database & UNIX as demonstrated by minimum of 1 yr of exp. Must have minimum of 1 yr of project management exp. The position will req 40 hrs per wk, 8:00 am to 5:00 pm. Salary: \$64,000 per yr. Applicants must send resume to 7310 Woodward Ave., Room 415, Detroit, MI, 48202. Reference number 160095. Employer paid ad.

Software Engineer needed for Telecommunications Services Firm in Atlanta, Georgia. Job duties include analysis, design, and development of software application using a variety of computer tools and techniques. Will determine client requirements, perform program coding, implementation, documentation and maintenance support. Will prepare technical reports, user manuals and instructional manuals as required by clients. Provide on-site maintenance support to clients on various customized software packages including debugging, modification, fine-tuning and code organization. The environment will be an IBM-3090 and AS/400. A specific environment will be cellular telecommunications industry applications. Will code in RPG/400 and COBOL 400 and use SQL, JCL, LANSA, CL, Hawkeye, EZVIEW, and Extensio. Applicant must have a B.S. in Statistics or Computer Science. A foreign degree is acceptable if determined to be equivalent by a recognized authority. In addition, the applicant must have 2 yrs. exp. in the job duties described above or as a Systems Analyst to include 2 yrs. exp. with AS/400, CL, LANSA, RPG 400, COBOL 400 and 1 yr. exp. in cellular billing environment. 40 hrs/wk, Mon-Fri., 8 a.m.-5 p.m. \$47,267/yr. Send 2 resumes and cover letters (no calls) to: Georgia Department of Labor, Job Order #GA 5910422, 2943 N. Druid Hills Rd., Atlanta, GA 30328, 3909 or the nearest Department of Labor Field Service Office. Must have proof of legal authority to work in the U.S. AN EMPLOYER PAID AD.

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PROGRAMMER ANALYST [2 openings] (Ref. 167795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems. Analysis, design, development, unit testing, sys. testing of business applications using Unisys 4GL, LINC II on Unisys A-Series & U-Series machines. Duties include use of LDA III, DMS II, WFL, DMINQUIRY, ERGO & other related s/w; conducting training for LINC 15 on UNIX. Design & develop LINC based sys. & using IBM mainframe & COBOL. Regs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 5 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including design & development of LINC based sys. & using each of the following: IBM mainframe, Unisys A Series, Unisys U Series & COBOL. \$43,500/yr. 40 hrs/wk. 8:30a-5p.

PROGRAMMER ANALYST [2 openings] (Ref. 167695) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems. Analysis, design, develop, implement, and maintain software application systems involving mainframe & PC h/w and s/w including IBM 3090, Visual Basic, MVS, CICS, DB2, JCL and VS COBOL II. Regs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 5 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including analysis, design, coding, testing, implementation, database administration and using each of the following: IBM mainframe, MVS, CICS, DB2, JCL, & VS COBOL II. \$43,500/yr. 40 hrs/wk. 8:30a-5p.

PROGRAMMER ANALYST [2 openings] (Ref. 167895) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems. Design, develop, integrate and support a configurable window sys. for credit card operations using SUN workstations, SUN OS/Unix operating sys., X-Window, X-view & Motif toolkits, SQL, C, C++, UTL, languages, Devguide, UNIX & XDesigner GUI builders, Informix database, SCCS and Sable release control sys. MacCabe reverse engineering & testing tool, performing quality inspections, programming, bug fixing, unit & load integration testing. Also using Xlib, Regs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 5 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Customer Support Engineer. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including software design, programming, bug fixing, unit and integration testing and using each of the following: C, X-View, Xlib and Informix. \$47,000/yr. 40 hrs/wk. 8:30a-5p.

PROGRAMMER ANALYST [2 openings] (Ref. 167995) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; re-engineer, enhance, customize an integrated financial & insurance Loss Reporting Sys. including redesign of modules. Responsibilities include meeting with users & requirement definitions, process & data flow design & data modeling using structured methodologies, technical & installation support & database administration. Using IBM 3090/MVS-JCL/MVS-TSO, CICS/DB2, COBOL, UNISYS 2200/900 & 2200/400 and U6000 Series MAPPER. Also using s/w estimation techniques, project management & s/w analysis & design tools. Regs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 5 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Customer Support Engineer. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including system analysis, design, development and implementation using MAPPER on UNIX-based UNISYS U6000. \$43,400/yr. 40 hrs/wk. 8:30a-5p.

PROGRAMMER ANALYST [2 openings] (Ref. 164195) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems. Enhance, design, develop the product, Product Manager. Dynamic SQL is incorporated in new version of Product Manager. Working on RS-6000 SUN SPARC, HP 9000/735, ORACLE 7.1, DB2 Ver 2 (BETA RELEASE), C, SED,++, OOP, PROC, CALL LEVEL INTERFACE, AIX, SOLARIS, HP-UX, EASY-SQL & SQL*DMX. The code is database independent & generates respective SQL statements for the database Regs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 5 yrs. exp. in job offered or 1 yr. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Assistant Systems Analyst, Software Engineer, Member, Technical Staff or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including use of each of the following: SUN SPARC, ORACLE, EASY-SQL & SQL*DMX. \$46,200/yr. 40 hrs/wk. 8:30a-5p.

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SOFTWARE ENGINEER required. Interface design & database development using ORACLE-7 RDBMS, Object Oriented methods, C++, Simulation techniques. Visual Basic & Pascal. Will work on both VAX/VMS platforms & on various UNIX based platforms (OS, AIX, Ultrix, etc.) using expertise with the UNIX & VMS operation systems. Masters Degree or its equivalent required in Math, Computers or Engineering, plus 1 year experience in the job duties described above. University level project work may be used to satisfy the experience requirement. Must have proof of legal authority to work in the U.S. Salary: \$37,500/year for a 40 hour work week. Interested applicants apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001, JO#TX212277. Ad paid by an Equal Opportunity Employer.

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Systems Engineer to perform analysis and design of an integrated Manufacturing and Assembly System. Responsible for process and data flow design, data model, technical support and integration design of application and meeting with users to gather requirements; provide technical support for design of applications on IBM 3090 using the following hardware, software and languages: IBM 3090, MVS/ESA, VM/SP, CMS, CICS, DB2, VS COBOL, JES-2, SDF, VTAM, TSO, CLIST, XPF, DITER, REXX, GDDM, WINDOWS, MS-ACCESS, SQL, MS-DOS, FTP, NOVELL. Network WORLD PERFECT and LOTUS. Regs: Bachelor's in Computer Science, Electrical or Electronic Engineering or foreign educational equivalent; 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. as a Systems Analyst. Must have some related experience including use of each of the following: IBM 3090, MVS/ESA, CICS, DB2, COBOL, ADW, CMS, VM/SP, JCL, REXX and UNIX. \$43,415/yr., 40 hrs/wk., 8a-5p. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #163995 "Employer Paid Ad"

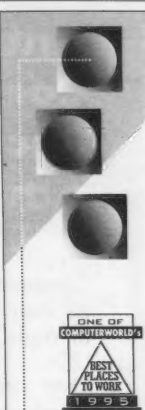
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For campus-wide support of computer and network hardware/software. Reg: A.B.S. in computer science or a related field with two years professional experience and three years Network 3.11 or 3.12. Technical skills wiring, ethernet, Network and micro support (IBM PC and Mac). Supervisory experience preferred. Salary to \$42,000 depending on qualifications. To be considered please submit resume, salary history and telephone numbers with three written references by 11/29/95 to Stan Clark, Director of Human Resources, Indiana University Kokomo, P.O. Box 9003, IN 46904-9003. EOE.

Software Engineer: Codes, tests, designs, develops, and modifies a medical system software package which is used to analyze blood flow for purposes of cardiovascular diagnosis. Will use high physical mathematical calculations and permutation to convert massive data stored in a relational database into 3-D imaging for use in medical analysis. Will perform interface design and create Object-Oriented Programs to be implemented in a Graphic User Interface for Windows application in a X-Window or Motif format. Will ensure that software performs fault free data acquisition analysis and conversion of such data to 3-D image software for medical systems development. All work will be performed in a UNIX environment as well as coding in C++ for SUN and SGI workstations. Requires Master's degree in Computer Science, Math or Physics. Also requires two years experience in the job to be performed or two years experience as a Programmer Analyst. Education to include completion of a project in which the individual modified at least two programs in three dimensional or holographic imaging using X-Windows to perform various physical mathematical calculations. If experience in related field, entire experience must include programming and analysis to perform higher physical mathematical calculations using C and C++ in a X-Window environment on a SUN or SGI workstation for relational databases. Hours: 8:00 a.m. - 5:00 p.m. \$22,000/yr., 40 hrs/wk. Qualified U.S. workers are encouraged to apply for this position. Send resume to: JETS - BMS, Allen Alien Certification, Attn: Mike Brooks, P.O. Box 7972, Madison, WI 53707-7972. Please reference Case Number #950255 on application materials. Employer Paid Ad.

Applications Engineer to design, develop & implement engineering proposals for software applications in Coordinate Measuring Machines (CMM) & robots; write specialized application programs for part inspection using DMIS, C & DOS Batch command languages; develop solutions to improve accuracy in CMM tools using software error compensation models; provide solutions to effectively integrate CMM to CAD systems; design, develop & implement effective methods for post inspection analysis of dimensional data; design guidelines for application support & training of CMM software; maintain existing technical documentation; develop new ones; create programs & literature for demonstrations, marketing & sales. Regs: Master's in M. Mech. Engng. 1 yr exp. in job offered or 1 yr related exp. such as CMM Applications Engineer. Related exp. must include developing programs using DMIS to operate CMM; Implementing CAD-CMM integration; post inspection engineering analysis & providing software solutions to evaluate dimensional inspection data. Must have grad. level courses, 1 each in: Numerical Methods, Control System Theory, Computer Aided Design, & Geometry Mechanisms of Robots. Must have thesis/project/exp. in error compensation in machine tools; \$20.42/hr., 40 hrs/wk. 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #166195 "Employer Paid Ad"

Project Engineer, Software Development - Software development for industrial engineering application; developing engineering applications on UNIX workstations and PCs using C and C++ programming languages to write data translators & interactive engineering graphic applications; developing codes for creating mechanical & industrial engineering systems through a graphical interface & for extensive post-processing of these systems including Computer Aided Engineering, Concurrent Engineering & Artificial Intelligence. Regs: Bachelor's in Industrial & Production Engng., Mechanical Engng. or Comp. Science; 3 yrs. exp. in job offered or 3 yrs. exp. in related occup. as a Product Eng. or Software Eng. The 3 yrs. related exp. must include each of the following: Designing software tools for rubber products using Pro/ENGINEER, FORTRAN, UNIX and C; also using artificial intelligence for industrial applications. \$3,167/mo., 40 hrs/wk., 8a-5p. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #152295 "Employer Paid Ad"



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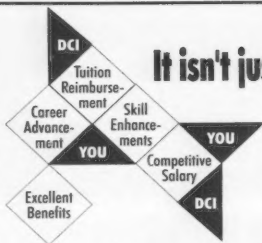
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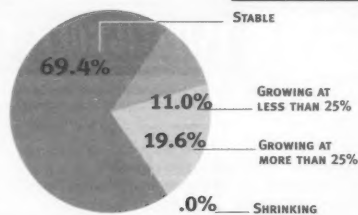
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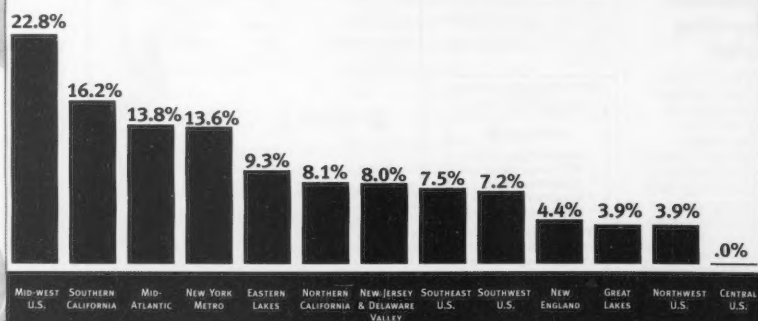
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Comdex

By Amy Malloy

Want to spend a week networking with 200,000 of your colleagues? If so, go to Comdex/Fall '95 in Las Vegas next month. "Big" is the word repeatedly used to describe the annual trade show, and big it is. With more than 1,000 product announcements and thousands more products on display, vendors will try to turn heads their way. And they will do everything imaginable to draw your attention. Vendors also will be fighting the inevitable temptation of the gambling tables for your attention. *Computerworld* asked attendees what motivated them to become part of the fanfare created by the biggest show in the industry. They offered the following comments:

MATTHEW REYNOLDS
Systems analyst

 TRW, Inc.
 Redondo Beach, Calif.

"I'm going for fact-finding. There are a couple of seminars that look really interesting. I'm going for informational purposes and to explore and report on new technologies for my company. I'm [looking] for anything to do with client/server, object-oriented programming and [Microsoft Corp.'s] Visual Basic programming. I'll educate the staff on the current technology and different techniques that I pick up there."

ALAN ALDORTH
Vice president of operations and development

 Tribune New Media/Education
 Chicago

"We operate businesses in this industry. I think it's important to go to the key trade show and walk the

floors so we can be aware of everybody in the market and their products. It's really curiosity and education. It's good to get a sense once a year of what's going on. I'm always interested to see what the total industry and marketplace consists of from year to year in terms of companies and products. It's really an overview of all the players. I'll watch the product demonstrations, but there are usually lines around the products that are available for testing. I don't have the time or the patience. If I really want to try it, I can buy it and try it."

NICK DUNCAN
President
 GlobalData
 Oklahoma City

"I've never been before, and I'm expecting a zoo. I'd like to see some specialized imaging shows. They are applicable to our core business. I'd also like to

see the latest in mobile technologies. I don't come from a technical background, so some of the high-end network stuff isn't in my realm. I'd like to see if there is anything new from Watermark [Software, Inc.] or FileNet [Corp.], if they end up out there. I'll be interested to hear what IBM is going to do with Lotus' Notes. It will be my first time [to Comdex], and from what people tell me, it may be my last."

DAVID VERGEYLE
President,
Chief operating officer
 John Ryan Co.
 Minneapolis

"We go there to see what the vendors have available. We're interested in seeing digital MPEG1 and digital MPEG2, display technology and flat-screen TVs. We're even more interested in what they're not showing but what they're talking about and what we can expect will show up in the future. It helps us understand which competitors might be coming to market and what products might be coming out in the future that might obsolete what we are doing today. Going to the speakers really gets to the issue of what new technology they're thinking about but not showing. We usually come with three or four people and divide the show up. We get together in the evenings to exchange information and decide where we should focus."

JOHN WISNIEWSKI
Manager of advanced technologies

 Wm. Wrigley Jr. Co.
 Chicago

"First, I go to Comdex to learn about emerging or advanced technologies. Second, I look at the show as a forum in which I can network with people in the industry with similar technology infrastructures. Third, I go to build better relationships with vendors. I do two things after Comdex: I write a synopsis of what I call the highlights of the sessions, and I

put all the information that I gather into folders. I pass it around to my professional peers [in information systems]."

JAN EKONOMY
Director of new business development
 NEBS Software and Services
 Nashua, N.H.

"I can conduct the amount of business at one Comdex show that to do outside would take up to two or three weeks traveling around the country. I spend very little time actually going up and down every single aisle. I don't go to hear speakers or to hear about the big attractions. I go to conduct business and network. I think the only drawbacks are a matter of logistics. The most challenging part of the whole show is just getting where you need to be in a timely manner. After Comdex, we solidify partnerships and continue to nurture contacts until eventually it culminates into some business that makes sense for both parties."

ANDREW LICKLY
Third-party product manager

 FTP Software, Inc.
 North Andover, Mass.

"I'm going because it's the place where people in the industry meet, and it's the one opportunity to get everybody in one spot. You can track them down and talk to them [in person]. There is nothing like putting a face to a voice and a name. Comdex is a good place to meet with people to talk about technologies, standards and industry-based topics. I think we're going to be bludgeoned over the head with Windows 95 products, services and add-ons. I have enormous expectations because Comdex keeps getting bigger. Every year, I try to prepare myself for how big the show is, and still it always surprises me. It is getting to the point where five days of Comdex aren't enough." ■

Malloy is *Computerworld's* assistant researcher.



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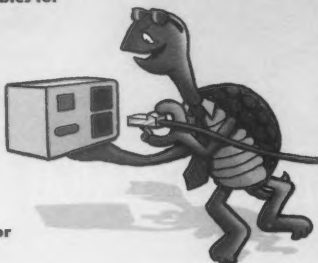
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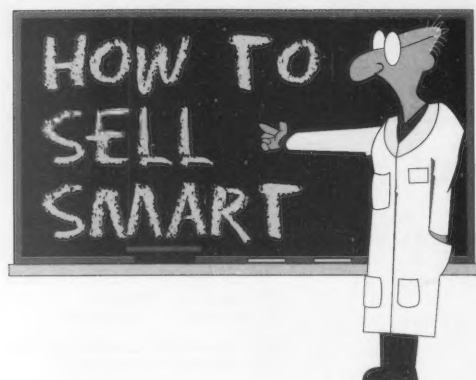
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INTUIT INC. (H)	21.6	ATI DIMENSION	-27.9
QUARTERDECK CORP.	19.6	VIEWLOGIC SYSTEMS	-24.5
NETSCAPE COMM. CORP.	18.9	INTERSOFT INC.	-23.4
RASTEROPS	16.2	CHIPS AND TECHNOLOGIES	-20.4
NET WORTH INC.	15.3	AMERICAN POWER CONVERSION	-20.4
COMPUWARE CORP. (L)	14.6	UNISYS CORP.	-20.3

Dollar

NETSCAPE COMM. CORP.	13.25	KONIG INC.	-11.75
INTERSOFT INC.	12.25	TEXAS INSTRUMENTS	-4.88
FORE SYSTEMS INC.	5.88	US ROBOTICS (H)	-4.50
COMPUTER ASSOCIATES	5.13	SYSTEM SOFTWARE ASSOC.	-4.06
NET WORTH INC.	3.75	APPLIX INC.	-3.50
QUARTERDECK CORP.	3.60	VIEWLOGIC SYSTEMS	-3.25
PICTURETEL CORP. (H)	3.43	QUANTUM CORP.	-3.25

Internet investors get leg up

The investing public has a voracious appetite for Internet-related products, so the American Stock Exchange (AMEX) has decided to feed it. This past week the AMEX began trading options on the *Interactive Week Internet Index* (IIX), which comprises 37 Internet-related companies. It is a new options index developed in conjunction with *Interactive Week* magazine.

The AMEX has two other broad technology indexes: the *Morgan Stanley High-Tech 35 Index* (MSH) and the *AMEX Computer and Technology Index* (XCI).

For the Internet Index, the AMEX "looked for companies [with Internet-related technology] that were either right now or with technology that is expected to shape the future of the Internet," said Dan Noonan, manager of public relations at the AMEX. The Internet Index includes Internet service providers, commercial on-line service companies, Internet tool companies, providers of videoconferencing and interactive television and networking companies (see chart).

The Internet Index isn't a mutual fund that investors hope will only increase in value. It is an options index on which investors can speculate. If investors think this segment of the market will do well, they can buy contracts accordingly. If investors think this segment is overvalued and could tumble, they can buy contracts for that outcome.

Noonan said it will be interesting to see who invests in the Internet Index. Options investors are traditionally older and conservative, he said, while the Internet's image is a collection of young, hip start-up companies.

"The Internet Index is an... outgrowth of the current market passion for all things Internet," said Harley Ungar, a market analyst at Jupiter Communications, Inc. in New York. "Even for those who don't play the market, it happens to be a great barometer of where our information-based economy is heading."

—Stewart Deck


Index options

A sampling of the 37 companies in the AMEX Interactive Week Internet Index

• 3Com	• Novell
• America Online	• Optical Data Systems
• Broadband Technologies	• Sierra On-Line
• H&R Block (CompuServe)	• Spyglass
• Netscape Communications	• Sun Microsystems

Oct. 27 Stock Ticker

52-WK RANGE			Oct. 27 Wk Net Wk Pct 3PM CHANGE			52-WK RANGE			Oct. 27 Wk Net Wk Pct 3PM CHANGE				
Communications and Network Services													
OFF +0.7%													
COMS	53.63	19.50	3 COM CORP.	49.13	-2.63	-5.1	MGIC	11.50	3.63	MAGIC SOFTWARE ENTERPRISES	7.50	-0.63	-7.7
AUT	54.25	38.50	AMERTECH CORP. (H)	54.25	0.00	0.0	MANU	18.75	6.75	MANUQUIS GROUP INC.	16.50	-1.75	-9.6
APTS	15.00	6.75	APERTUS TECH.	8.38	-0.50	-5.6	MAPS	40.00	17.25	MARPHO CORP.	19.75	-0.44	-2.2
T	66.38	47.25	AT&T	61.75	-0.25	-0.4	MATH	7.38	2.00	MATHSOFT	5.25	-0.38	-7.2
ASND	58.88	7.00	ASCEND COMMUNICATIONS (H)	58.75	2.88	5.1	MCAC	56.50	13.50	MCAC ASSOCIATES	55.50	2.00	3.7
BNYN	19.75	6.00	BANYAN SYSTEMS INC. (L)	7.50	-0.63	-7.7	MENT	21.50	10.88	MENTOR GRAPHICS (H)	20.13	-0.88	-4.2
BDN	39.38	12.63	BOLT, BERANEK & NEWMAN	32.00	-2.75	-7.9	MGFO	15.00	9.44	MICRO FOCUS	9.44	-0.94	-9.0
BL	64.38	48.38	BELL ATLANTIC CORP. (H)	64.38	0.25	0.4	MGXI	13.88	5.00	MICROGRAPHICS	10.50	-1.00	-8.7
BEL	76.75	50.50	BELLSOUTH CORP.	74.63	-0.63	-0.8	NETM	27.25	12.00	NETMANAGE INC.	19.00	-1.25	-6.2
BRKT	22.25	9.25	BROOKTRUST TECHNOLOGY	19.25	1.25	6.5	NSCP	83.25	45.75	NETSCAPE COMM. CORP.	83.25	13.25	18.9
CS	79.25	37.38	CABLETRON SYSTEMS (H)	77.25	1.25	1.6	ORCL	47.00	24.75	ORACLE CORP.	42.75	-0.19	-0.4
CGSM	25.13	12.25	CENTIGRAM COMMUNICATIONS	21.25	-1.88	-8.1	PMTC	69.00	31.25	PARAMETRIC TECHNOLOGY	66.25	-1.75	-2.0
CHPM	51.13	20.00	CHIPCOM CORP.	48.75	0.00	0.0	PARQ	22.75	7.25	PACIFIC PLACE SYSTEMS INC.	7.50	-0.75	-9.1
CSCO	78.50	27.00	CISCO SYSTEMS INC. (H)	75.50	-2.63	-3.4	PATK	26.00	13.50	PERIPHERAL TECHNOLOGY	18.13	-0.25	-1.4
CLD	11.38	6.13	COMPRESSION LABS INC.	7.00	-0.69	-9.9	PTEL	14.38	6.13	PHENIX TECHNOLOGIES	11.63	-0.25	-2.1
CMCT	12.75	4.75	COMPUTER NETWORK TECH.	6.56	-0.31	-4.5	PLAT	16.88	4.88	PLATINUM SOFTWARE	6.50	-1.50	-18.8
XCOM	14.50	7.75	CROSSCOM	11.00	0.00	0.0	PRGS	70.00	29.50	PROGRESS SOFTWARE CORP.	59.75	-2.63	-4.2
DASW	64.88	2.25	DATA SWITCH CORP. (H)	4.44	0.00	0.0	QDQ	22.13	1.94	QUARTERDECK CORP.	22.13	3.63	19.6
DIGI	64.00	26.88	DSC COMMUNICATIONS	38.75	-1.31	-3.3	RSTP	10.13	2.00	RASTEROPS	7.63	1.06	16.2
DFE	51.25	22.88	FOR SYSTEMS INC.	51.25	12.13	31.0	ROSS	7.75	3.50	ROSS SYSTEMS	3.50	-2.38	-40.4
CGM	35.88	9.25	GENERAL DATA COMM. INDS.	15.00	0.50	3.4	SREV	51.75	16.63	SERVO INTERNATIONAL INC.	38.00	-2.50	-6.2
GTE	41.13	29.88	GTE CORP. (H)	40.13	-0.38	-0.9	SPCO	6.25	2.88	SOFTWARE PUBLISHING CORP.	3.38	-0.25	-6.9
ITT	128.00	57.00	ITT CORP.	119.50	-2.75	-2.2	SOTA	12.50	0.25	STATE OF THE ART	10.00	-0.56	-5.3
ITC	27.13	17.25	ITC COMMUNICATIONS CORP.	25.75	1.13	4.5	WDIC	22.13	14.75	WESTERN DIGITAL CORP. (H)	21.63	-0.50	-2.3
MICM	15.50	5.50	MICROM COMMUNICATIONS CORP.	8.88	-0.50	-5.3	SDRC	21.13	4.63	STRUCT. DYNAMICS RESEARCH	18.38	-0.88	-4.5
MNPI	22.25	7.13	MICROM INC.	19.88	1.63	8.9	SVIS	55.00	19.88	SYBASE INC.	38.25	1.44	3.9
NETG	46.50	18.63	NETWORK GENERAL CORP.	4.50	0.44	10.0	SYMC	33.25	15.00	SYNCHRON TECHNOLOGY	66.00	1.00	1.5
NCKI	12.00	3.50	NETWORK COMPUTING DEVICES	5.88	0.25	4.4	SNPS	34.50	19.75	SynOpsys	34.50	2.25	7.0
NDWI	42.00	18.00	NETWORK EQUIPMENT TECH.	32.63	-0.20	-0.6	ASAX	45.75	11.63	SYSTEM SOFTWARE ASSOC.	33.75	-4.06	-10.7
NETC	46.50	18.63	NETWORK GENERAL	39.75	-0.56	-1.4	SYSC	33.25	6.75	SYSTEMS CORP.	10.00	-0.75	-7.0
NWTH	28.88	7.25	NET WORTH INC.	28.25	3.75	15.3	VIEW	24.00	7.88	VIEWLOGIC SYSTEMS	10.00	-3.25	-24.5
NN	43.25	25.00	NEWBRIDGE NETWORKS CORP.	28.63	-0.50	-1.7	VMRK	21.50	7.00	VMARK SOFTWARE INC.	7.38	-0.25	-3.3
NOV	23.13	14.00	NOVELL INC. (L)	14.38	0.13	0.9	WALL	55.50	14.50	WALL DATA INC.	15.75	-0.25	-1.6
NYN	48.75	35.88	NYNEX CORP.	46.75	-1.50	-3.1	WANG	19.50	9.13	WANG LABORATORIES INC.	17.00	0.63	3.8
OCTL	42.63	17.75	OCTEL COMMUNICATIONS CORP.	31.25	2.88	9.5							
ODSI	43.25	9.00	ODSI DATA SYSTEMS INC.	27.88	-1.63	-5.5							
PNRL	8.38	1.13	PENRL DATA COMM NETWORKS	6.00	-0.75	-11.1							
PCTI	64.75	16.50	PICTURETEL CORP. (H)	64.75	3.50	5.7							
PTN	10.75	4.75	PROTEON INC.	7.38	-1.50	-16.9							
RACO	7.88	3.00	RACOTECH INC.	6.13	-0.13	-2.0							
RETX	16.63	7.75	RETX INC.	7.75	-1.13	-19.0							
SFA	24.88	11.75	SCIENTIFIC ATLANTA INC.	12.50	0.50	4.2							
SBC	55.88	39.50	SOUTHWESTERN BELL CORP.	54.75	-0.88	-1.6							
SGS	95.63	36.25	DELTA COMPUTER CORP. (H)	89.63	-0.25	-0.7							
SMSC	31.63	12.50	STRATACOM MICROSYSTEMS CORP.	19.00	-0.13	-0.7							
STRM	60.00	24.75	STRATACOM INC. (H)	58.50	0.50	0.8							
STRM	8.13	3.25	STRATACOM INC. (L)	8.13	0.13	1.7							
USRX	96.25	16.75	US ROBOTICS (H)	89.00	-4.50	-4.8							
USW	48.38	29.63	US WEST INC.	47.00	0.00	0.0							
USX	21.00	9.00	USX CORP. (L)	9.88	0.00	0.0							
XLGX	68.25	13.13	XYLOGICS INC. (H)	67.25	0.25	0.4							
PC and Workstations													
OFF +0.4%													
AALR	9.63	3.63	ADVANCED LOGIC RESEARCH	6.50	-1.50	-18.8	AMD	39.25	22.38	ADVANCED MICRO DEVICES	24.11	-2.38	-9.0
APPL	50.13	33.63	APPLE COMPUTER INC.	38.63	-0.25	-0.7	ANAL	52.00	18.00	ANALOG DEVICES	30.50	-1.50	-4.7
ASTA	19.13	7.50	AST RESEARCH INC.	9.25	0.00	0.0	ATCL	16.63	5.38	ATMEL CORP.	19.50	-2.44	-10.4
CPQ	55.38	31.13	COMPAQ COMPUTER CORP. (H)	54.00	0.00	0.0	CHPS	15.88	5.13	CHIPS AND TECHNOLOGIES	9.50	-2.44	-20.4
DEL	95.63	36.25	DELL COMPUTER CORP. (H)	89.63	-0.13	-0.1	CI	41.13	11.63	CIPHER DATA SYSTEMS	41.13	0.00	0.0
GATE	33.63	16.00	GATEWAY 2000 INC.	32.88	2.88	9.6	CY	55.00	17.88	CYPRESS SEMICONDUCTOR CORP.	35.25	0.00	0.0
HWP	95.63	45.88	HEWLETT PACKARD CO.	92.50	1.50	1.6	DS	24.88	13.38	DALLAS SEMICONDUCTOR	21.00	-0.50	-2.3
MUEI	88.88	36.88	MICRON INTERNATIONAL INC.	20.88	-4.44	-6.4	INTC	78.88	28.75	INTEGRATED SILICON SYSTEMS	67.38	-0.25	-0.4
SGI	45.63	27.50	SILICON GRAPHICS	33.25	0.75	2.3	ISL	62.50	18.25	LSI LOGIC CORP.	48.13	-2.75	-5.4
SUNW	74.63	29.88	SUN MICROSYSTEMS INC.	71.38	1.88	2.6	LSC	45.00	8.88	LATTICE SEMICONDUCTOR	34.00	-0.50	-1.4
TAN	64.38	41.13	TANDY CORP.	51.88	-3.00	-5.4	MCU	94.75	17.38	MICRON TECHNOLOGY	69.63	-2.50	-3.5
Large Systems													
OFF +0.6%													
AMH	13.63	8.63	AMDAHL CORP.	9.13	-0.69	-7.0	MDT	82.50	51.00	MOTOROLA SEMICONDUCTOR	66.00	1.00	1.5
CNX	8.38	3.63	COMDEX COMPUTER	4.50	0.00	0.0	SERA	28.75	6.63	SERATA SEMICONDUCTOR	19.88	-0.88	-4.2
CYR	29.25	14.63	CAY RESEARCH INC.	20.63	-0.50	-2.4	STK	33.75	12.75	STES INSTRUMENTS	66.75	-4.88	-6.8
DGN	12.75	6.75	DIGITAL GENERAL CORP. (H)	12.00	0.75	6.7	TRC	13.13	3.88	TRICENTRONICS INC.	12.00	-0.75	-6.0
DEC	55.25	29.00	DIGITAL EQUIPMENT CORP. (H)	53.38	-0.25	-0.5	CNR	19.50	9.00	CORNER PERIPHERALS	18.75	0.13	0.7
ENR	8.13	1.00	ENTERPRISE SYSTEMS CORP.	2.00	0.13	6.0	CREAF	18.31	5.88	CREATIVE TECHNOLOGIES INC.	11.63	-0.50	-4.1
NHWW	10.50	10.25	HARRIS COMPUTER SYSTEMS CORP.	14.63	-1.50	-9.3	DATA	13.00	4.25	DATACORP INC.	8.50	0.38	4.6
IBM	114.63	68.88	IBM CORP.	96.38	-1.00	-1.0	DTM	9.38	4.50	DATASTREAM CORP.	15.50	1.75	12.7
MDIA	10.75	7.00	MORIDIAN DATA INC.	10.00	0.25	2.5	EMC	27.38	13.00	EMULEX CORP.	20.00	-1.75	-8.0
NETF	9.00	4.25	NETFRAME	5.75	-0.50	-8.0	ESCC	23.00	11.25	EVANS & SUTHERLAND (H)	20.00	-1.75	-8.7
QNT	25.38	14.13	SEQUENT COMPUTER SYS.	15.88	-1.88	-10.6	EXBT	24.00	10.00	EXARTE	13.25	0.25	1.9
SEC	10.00	3.13	SEQUENT SYSTEMS INC.	6.25	0.25	4.2	IBS	10.00	4.00	IBM BUSINESS SYS. INFGS.	2.63	0.25	9.5
SRA	39.88	23.00	STRATUS COMPUTER INC.	30.50	5.88	23.9	IOMG	30.00	2.88	IOLOGICA CORP.	13.25	1.50	6.7
TDI	19.75	10.75	TANDY COMPUTERS INC.	10.88	-0.38	-3.3	IPLSA	7.78	2.00	IPTECH SYSTEMS INC.	3.63	-0.75	-17.1
TRD	3.75	3.38	TRIDATA CORP.	3.88	0.00	0.0	MKTR	7.25	3.00	MATOR CORP.	4.69	0.50	10.9
UIS	13.63	5.88	UNISYS CORP.	5.88	-1.50	-25.3	MLIS	11.50	3.88	MICROPOLYS CORP. (L)	4.06	0.06	1.1
Software													
OFF +0.15%													
ADBE	66.50	27.25	ADOBE SYSTEMS INC.	54.25	1.00	1.9	MSGL	30.88	10.00	MICRO TOUCH SYSTEMS INC.	27.63	-0.38	-1.3
AMSW	8.63	2.50	AMERICAN SOFTWARE INC.	7.50	0.38	5.3	PEAK	31.75	13.25	PEAK TECHNOLOGY CORP.	24.81	0.06	0.3
APLX	33.00	9.75	APPLIX INC.	25.75	-3.50	-12.0	PNCL	27.75	8.75	FINNANCE MICRO INC.	22.25	2.75	14.1
ACAD	53.00	30.75	AUTODESK INC.	33.50	-2.75	-7.6	QNTM	28.88	13.75	QUANTUM CORP.	17.50	-2.25	-15.7
BACH	7.88	2.00	BACHMAN INFO. SYSTEMS	5.88	-0.13	-2.1	RABUS	15.00	3.00	RABUS INC.	13.00	-0.50	-3.5
BGSS	37.25	22.00	BGS SYSTEMS INC.	37.00	1.50	4.2	SEG	49.38	22.88	SEAGATE TECHNOLOGY	47.00	-0.25	-0.5
BMC	51.50	20.50	BMC SOFTWARE INC.	36.25	1.38	3.9	STK	33.25	17.88	STORAGE TECHNOLOGY	24.00	-0.38	-1.5
BOUL	34.25	20.38	BOULE & BARREAU (H)	32.75	-0.88	-2.6	XRX	138.50	90.63	XEROX CORP. (H)	133.38	-1.63	-1.2
BRIL	17.25	6.00	BORLAND INT'L INC.	13.75	0.13	0.9							
BKOC	11.75	5.75	BROCK CONTROL SYSTEMS INC.	7.75	0.88	12.7							
CESH	3.75	1.53	CE SOFTWARE	1.63	-0.25	-13.3							
CYE	22.00	9.38	CHRYSENE SOFTWARE INC.	19.13	-0.88	-4.4							
COGN	36.25	12.88	COGNOS INC.	31.88	-1.38	-4.1							
FILE	54.13	28.75	COMPUTER ASSOCIATES	54.13	5.13	10.0							
CYN	14.38	3.00	COMPUVISION CORP.	11.88	0.00	0.0							
CPWR	47.75	17.50	COMPUWARE CORP. (L)	21.63	2.75	14.6							
CSLE	32.38	10.75	CONSHARE INC.	29.50	1.00	3.4							
SCIR	10.13	4.25	CONTEL CORP.	8.88	-0.50	-5.3							
DWTI	16.25	9.00	DATAWARE TECHNOLOGIES INC.	11.25	1.00	9.8							
FILE	51.00	23.00	FILENET CORP.	45.13	-0.19	-0.4							
FRAM	33.00	13.75	FRAM TECHNOLOGY	28.31	0.75	2.7							
FTS	25.50	20.25	FTS SOFTWARE INC.	26.00	0.75	3.0							
GPTA	13.88	7.00	GPTA INC.	7.00	-0.81	-10.4							
HOGN	12.00	4.63	HOGN SYSTEMS INC.	8.25	-0.63	-4.9							
INFC	39.38	31.25	INFORMATION SYSTEMS CORP. (H)	31.25	-0.63	-1.9							



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UltraSPARC

CONTINUED FROM PAGE 1

will be willing to jump to the new technology and stay with Sun," said David Pensak, principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del.

The UltraSPARC boxes also bring Sun customers to a fish-or-cut-bait moment. They must move to Solaris 2.5 — a new version of Sun's Unix operating system that will be introduced this week — to run the UltraSPARC systems. "There's going to be strong pressure on [independent software vendors] and users to finally bite the bullet on moving to Solaris," said George Weiss, a research vice president at Gartner Group, Inc.

The product rollout will sharpen Sun's technical edge after three years of trailing the RISC chip performance of Unix rivals Hewlett-Packard Co. and Digital Equipment Corp.

Sun's last major overhaul of

its product line was in 1989.

For the UltraSPARC line, Sun reworked its entire workstation design, wrapping it around new processors and rewiring it with fast connections to handle multimedia and high-speed networks. Analysts expect Sun to cut prices for its older SuperSPARC workstations and add high-end multiprocessor desktops and UltraSPARC servers next year.

Performance boost

The machines have garnered praise from some beta sites, which reported performance boosts of two to seven times that of older Sun workstations.

"We had two to four times improvement in performance on our imaging application," said Rex Hays, a design engineer at Eastman Kodak Co.'s advanced development product group in Rochester, N.Y.

First to roll out will be powerful midrange workstations (see story at right). Solaris 2.5 for UltraSPARC will be announced at the same time, as will 64-bit

compilers that let users' 32-bit programs take advantage of the 64-bit chip's speed.

The jump from older systems running the SunOS operating system could cause some longtime users to balk, however. Many customers had waited for software vendors to port packaged applications to Solaris 2.x. Today, some 5,700 of the 10,000-plus Sun-compatible applications run on Solaris 2.x.

But many users haven't yet adapted custom applications to Solaris 2.x. "The problem is the homegrown applications that are running," said Ahmad Saadeh, a software engineering supervisor at Space Systems/Loral Corp. in Palo Alto, Calif.

Still, Sun's new hardware should reward loyal users, Pensak said. "Sun's overwhelming strength has been its software," he said. "If their hardware comes close to catching up with their software, they will be a formidable force in the industry."



Windows scales up, too. See page 45.

Fusion meets need for speed

Beta-test sites that have tried Sun's Fusion workstations say they run 32-bit applications much faster. This includes even those that aren't recompiled for the new 64-bit hardware, users said last week.

"Our application ran four times faster than what we would otherwise run on a 50-MHz SPARCstation 10," said Peter Lomdahl, a staff scientist at Los Alamos National Laboratory in New Mexico.

The laboratory also used SunPro 4.0 compilers for Solaris 2.5 "that take full advantage of the 64-bit architecture," he said.

The first crop of 64-bit workstations will use 143- and 167-MHz 64-bit UltraSPARC chips, said Andrew Feit, director of workstation research at Dataquest, Inc.

in San Jose, Calif. Uniprocessor and dual-processor models will eventually replace the SPARCstation 20 machines.

The workstations will have fast graphics subsystems that play off the UltraSPARC chip's Visual Instruction Set for on-board multimedia and video-stream processing.

Overall speed will be boosted by the UltraSPARC Port Architecture, a crossbar switch that can move data among two or more CPUs at speeds of up to 1.3G byte/sec., sources said last week.

Despite the changes, users still will be able to use their GX-series graphics accelerators and Sun-standard Sbus connectors that link system components.

—Jean S. Bozman

Reality check

CONTINUED FROM PAGE 1

"Network and systems management is secondary to getting the business done," said Tim Tokarsky, vice president of distributed systems management at Merrill Lynch & Co. in New York. "I want a selection of point products with open, documented and free application programming interfaces so we can build our own solution."

Ongoing hassles with "management-impaired" products and vendors brought back Wedge Greene, senior data services engineer at MCI Communications Corp. in Richardson, Texas, to this year's conference.

Greene said he wants "standards compliance beyond lip service," which means "good behavior so we can make everything work together without unexpected responses or unexplained data."

However, other users said they remain leery of assembling their own management arsenal because of immediate need and limited resources.

One director of network management at a transaction service organization came seeking "more than piece parts" for his operation's staff. "We hope to gain a global view of all components and functions in a mixed SNA and routed network," he said. The management platform he said he wants would be enterprise-wide with integrated tools.

Once a management system is in place, its operators need help making sense of all the reported data.

British Columbia Systems Corp. has a hierarchy of management servers in place. But the network control center staff must deal with more than 40,000 alarms on some days, half of them from the SNA network, according to Keith Finnie, manager of network management systems at the utility.

"Any tool to help us reduce the alarm stream and put the alarms in context will help," Finnie said.

With delivery systems in place, administrators demand tools to track the systems supporting sales, finance, service and other business functions.

George Hsieh, a consultant to the field support organization at Price Waterhouse, specifically sought help managing key client/server applications. Monitoring faults is a first step, but "I would love to monitor performance so we can meet service-level agreements with clients," he said.

Many discussions last week addressed cost factors.

At MCI, the rapid spread of networks is compelling Greene to demand consistent vendor pricing. He said he resents "taxation" per number of devices or users and prefers a way to pay for overall functionality.

One horror story making the rounds illustrated the costly mistake of focusing on a management platform instead of the

total bundle of management components.

A retail organization spent six months evaluating a network management platform, ultimately choosing a popular Unix configuration at a cost of \$80,000 for two management servers with consoles. However, distributed agent software for 3,000 managed sites costs 10 times the platform price.

Administrators also bemoaned their inability to hold on to that most precious resource: personnel.

"Finding technology is easy. Finding money is hard. But finding, training and keeping experienced people is hardest," said Randy Smith, management project manager at United Parcel Service, Inc.

With support for Microsoft Corp.'s Windows NT high on the list of many users here, vendors assured attendees at the Enterprise Management Summit 95 conference last week that they will indeed deliver for NT — as well as for other software platforms.

IBM, for example, is porting the 32-bit SystemView for OS/2 to Windows NT, said Don Haile, general manager of IBM's networking software division.

The OS/2 version for SystemView is in beta testing now and is scheduled for release at

NT, Unix platforms attract support from leading vendors

Comdex/Fall '95 next month.

IBM will also provide a Windows NT-based client console that can access a server running SystemView for AIX. IBM will even support Sun Microsystems, Inc. platforms next year, Haile said.

Overall, network and systems managers were looking for cheaper, simpler systems for management tools as they try to delegate control of distributed environments to more

staff and to remote sites.

The leading vendors — Hewlett-Packard Co., IBM and SunSoft, Inc. — have been protecting their Unix base and watching to see if Windows NT succeeds, said Charlie Robbins, director of communications research at Aberdeen Group, Inc. in Boston.

"Anyone not offering an NT platform next year will be in big trouble," he said.

SunSoft will ship a version of

its Solstice Enterprise Manager for HP platforms to development partners, mostly telecommunications providers, in two months.

Simplicity takes longer, however. A prototype Windows 95 and Windows NT client now in the lab will let operators access a Solaris-based management server, but probably not until 1997, said Walt O'Malley, senior manager for enterprise management products

at SunSoft.

For their part, HP officials said that once-separate Windows and Unix product groups at HP now must function as a single product team to work with developers and support users.

Under way are OpenView versions for Windows 95 in workgroups and Windows NT for more extensive networks.

Windows NT-based platforms also are available now from Digital Equipment Corp. and will be available next quarter from Cabletron Systems, Inc. — Patrick Dryden

The Back Page

Sooner better than later on data integrity

Charles Babcock

Robert Typanski, manager of data, methodologies and architectures at Bayer Corp. in Pittsburgh, underscored a lesson in data warehousing when he noted that his IS shop enforces data integrity in a setting that doesn't automatically encourage it.

Typanski, a member of a panel recently convened in Phoenix by *Computerworld*, is a pioneer in creating data warehouses, the informational databases that are built separate from a company's operational systems. In Typanski's case, each of Bayer's business units can order and pay for its own data warehouse.

The independent business units want to get their data as quickly as possible and at minimum cost. The IS staff has no incentive to make sure the current spot view of the data is suitable for broader use or reuse with a future system.

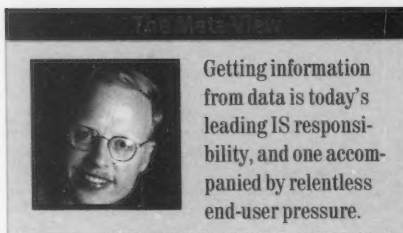
Bayer's IS department takes a pragmatic approach to developing data warehouses. It

quickly accomplishes the task through constant interaction on a prototype with the data's users. But IS is then left to reconcile the different definitions and descriptions between projects.

Typanski says 50% of his staff's time was spent "in data modeling, requirements-gathering and getting the business definitions and descriptions to populate a data warehouse directory."

Establishing the databases took 25% of the time, and 25% was spent moving data into the warehouse from legacy databases such as IBM's IMS, Computer Associates' IDMS or transaction-based operational systems. So 50% of its time was spent discovering the data end users needed and the format in which it was most useful, and in capturing the definition of the data from the core business.

"One of the things we keep reminding our internal customers



Getting information from data is today's leading IS responsibility, and one accompanied by relentless end-user pressure.

is that if we had done [enterprise-wide data definition] when we did the operational systems [both legacy and current], we would be saving all this time," Typanski says.

This is an old idea that has come around again. Without clear definitions that relate data to business functions, valuable data remains a bunch of undecipherable alphanumeric strings, worthless beyond its immediate use. Getting information from reams of data is today's leading IS responsibility, and one accompanied by relentless end-user pressure.

Data administration is a "highly leveraged activity," Typanski says.

When you do it up front for your transactional systems, you can invest more time and money later in extracting information from them. If you don't do it up front, you'll be forced to do it on the back end.

Data modelers and database administrators are being coached to prevent contending projects from turning into poor data administration. "We're shouldering that responsibility to try to integrate the data for the benefit of the whole company," he says.

Moving to Microsoft's Windows NT instead of Windows 95, as was advocated here Oct. 9, remains a hot topic. Kevin Warnock, CEO of Document Automation Systems in San Francisco, adds the following comments:

"One point I would like to make about your Oct. 9 column is that there is no free support for NT. With Win 95, one gets 90

days of free support. For a company that is regularly buying Win 95, the MIS people will be able to always call for support, since at least one 90-day period is likely to be running. I run NT, and love it. But if I run into something I can't solve myself, I will have to pay \$150 per event to get it fixed. This is roughly what NT costs! In spite of all this, I still think all companies should skip Win 95 and go directly to NT."

A new breed of chip, the media processor, is about to emerge. It was designed to move sound, video, graphics, modem and phone communications quickly over a network. Theoretically, inexpensive media processors soon will move gigabits-per-second of data through broadband pipelines, making a comparable effort by an Intel PC processor look like "sipping through a straw," says John Moussouris, CEO of MicroUnity Engineering Systems, Inc., a chip producer in Sunnyvale, Calif.

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Inside Lines

Stealing Intel's thunder

Seems like vendors just can't keep their mouths shut when it comes to Intel's Pentium Pro chip. While the chip maker itself has been coy about revealing much detail about the Pentium Pro, some of its major customers have been eagerly spilling the beans for several weeks now. The dizzying game of one-upmanship reached a crescendo last week, with some vendors finally just tossing their useless nondisclosure agreements out the window and sending in news releases about their planned Pentium Pro products. Intel is going to formally announce the chip this week, like a footnote to the whole affair.

Calling all champions

IS departments looking to install imaging systems should forget about an exhaustive product comparison. The first thing you have to do is get a Champion, according to speakers and attendees at last week's Imaging Expo in New York. The Champion, usually someone in a high-level business management position, is needed to defend the costs and benefits of the imaging system against attacks from other departments in the company.

Say it ain't so, Jim

Lotus is giving Jim Manzi a send-off on the company's World Wide Web page in the Cambridge, Mass., company's classic, quirky style. The page, dubbed "Jim, you are a visionary," includes baby pictures of Manzi and a hotlinked photo collage of Manzi's tenure at Lotus. Each section of the collage is linked to a retro-

spective piece on one event. If only Jim had \$1 for every hit on the Web page now that he is out of a job. Then again, he probably does, thanks to IBM!

Rolling toward NT

Intel next week plans to roll out a version of its LANdesk desktop management tools that broadens administration beyond Novell, Inc.'s NetWare to Microsoft Corp.'s Windows NT workgroups. Managers will be able to manage Windows NT servers, distribute software and remotely control, inventory and diag-

nose PCs from a Windows NT console. Interoperability with Microsoft's Systems Management Server (SMS) fills in server control missing from the SMS, a source said last week.

oops.we.give! we.give!

The Marketry, a Seattle-based marketing firm we told you about in this column last week, has decided against selling lists of electronic-mail addresses culled from Internet newsgroups. A torrent of red hot flame mail forced the company to stop selling the addresses of Internet users after less than two weeks on the market, a Marketry spokesman confirmed. "We decided we don't want to be a pioneer in this area," he said. He declined to say just how much angry E-mail the company and its Internet access provider received when word got out.

Now we know why reporters hate to give out their E-mail addresses to the general public relations populace. After receiving a string of superfluous messages from one PR woman all week (on top of phone calls and faxes to update us, by the minute, on her product's ongoing name changes), we received a message from yet another PR worker at the same California vendor. Turns out the first PR woman had inadvertently been sending documents out that contain viruses. Oops. They were "sorry for any inconvenience." If you have similar tales of woe to share, get in touch with *Computerworld* via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.

The 5th Wave by Rich Tennant

Arthur inadvertently replaces his mouse pad with a Ouija board. For the rest of the day, he receives messages from the spectral world.





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